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THE SCOTS FARMER:

OR

SELECT ESSAYS

ON

AGRICULTURE;

ADAPTED

To the SOIL and CLIMATE

OF

SCOTLAND.

VOLUME II.

——— Laudato ingentia rura;
Exiguum colito, VIRGIL.

Venio nunc ad voluptates agricolarum, quibus ego incredibiliter delector; quae nec ulla impediuntur senectute, et mihi ad sapientis vitam proxime videntur accedere. CICERO.

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THE SCOTS FARMER,

NOVEMBER 1773.

ARTICLE I.

Of ſome general things to be attended to in the management of a farm—Of the Climate—Of the Soil—Of the common practice of the country—Of the preceeding management of the farm—Of Oeconomy.

[Dickſon's Agriculture, Vol. II.]

VIRGIL wiſely recommends to the huſbandman, carefully to attend to the climate, the winds, the practice of his forefathers, the particular method proſecuted in the preceeding management of his farm, and the plants for the nouriſhment of which his ſoil is beſt adapted *.

A ſcheme of huſbandry, in which little attention is given to the climate, though the very beſt in appearance, muſt, however, be unſucceſsful in practice.

The climate determines the times of plowing and ſowing; it directs our choice in the kind of plants to be cultivated; it regulates the whole œconomy of the farm, and informs the huſbandman how to appoint the order of the different kinds of labour neceſſary, ſo as he may be always uſefully employed.

* At prius ignotum ferro quam ſcindimus aequor,
Ventos, et varium cœli praediſcere morem
Cura ſit, ac patrios cultuſque habituſque locorum,
Et quid quaeque ferat regio, et quod quaeque recuſet.
Hic ſegetes, &c. Geo. 1. lib. 50. ver. &c.

The knowledge of the particular method obſerved in the preceeding management of a farm is not of ſmall importance If it has been ſucceſsful, it ought not to be raſhly or ſuddenly changed. If it has proved unſucceſsful, the cauſe ſhould be inquired into; and if this is found out, the farmer will receive inſtruction from the errors of his predeceſſors.

The knowledge of the common practice of the country; or of our forefathers, though not ſo important as the knowledge of the other two things mentioned, is, however, not to be deſpiſed. We ſhould not only know the eſtabliſhed cuſtoms, but ſhould likewiſe endeavour to trace out their cauſes. There is ſcarcely a cuſtom that prevails in any country, however abſurd it may appear in the eyes of ſome perſons, but is founded upon ſome good reaſon, and probably, at the time when it was eſtabliſhed, was a real improvement. The knowledge, therefore, of theſe cuſtoms, and of their original deſign, muſt be advantageous. This, at leaſt, may enable the farmer to avoid miſtakes in changing them in his practice. An enquiry into theſe things neceſſary to be attended to in the management of a farm, is the ſubject of this treatiſe.

Of the Climate.

Nothing has more effectually retarded the progreſs of agriculture, than the attempts that have been made to introduce general ſchemes, without any regard to the climate. A lover of agriculture, captivated by a ſcheme of huſbandry which he has obſerved in Flanders, or in ſome of the ſouthern counties of England, without any proper preparation, attempts to put this ſcheme in practice in one of the ſhires of Scotland, notwithſtanding the great difference of climate. This attempt proves unſucceſsful, as it is natural to expect, where circumſtances are ſo different, and the natural averſion of the farmers to change their ordinary practices is thereby rivetted in them †. The

† Cuſtom is very powerful: The things which, in our younger years we have been taught to regard, continue to make an impreſſion upon us, and

We may conſider it as a thing certain, that the ſcheme of management proſecuted in every country is in ſome meaſure adapted to the climate; for this is a thing to which experience would naturally lead the moſt inattentive. A few trials would determine what plants ſhould be cultivated, at what ſeaſons the land ſhould be plowed, and the ſeed ſown; and therefore, without a knowledge of the climate, no proper change can be made in the ordinary ſchemes of management, no new ſcheme proper for the country can be formed, nor improvement made. Columella repreſents the knowledge of this as of very great importance. For, ſays he, whoever would be perfect in this ſcience, (agriculture) muſt be well acquainted with the nature of things, and muſt not be ignorant of the various climes, that he may know what is proper for every country: He muſt know perfectly the riſing and ſetting of the ſtars, by which the various ſeaſons are regulated, that he may not be attacked by winds or rains in the beginning of his operations, and thereby his labours be fruſtrated *. The

and we cannot be perſuaded to change our opinion of them without very good reaſon. This influence that education has upon mankind, is, of all others, perhaps the greateſt bleſſing to ſociety, and therefore none but ſuch as are enemies to ſociety, attempt to ridicule a thing ſo natural and beneficial. The gentleman and farmer appear in a very different light with reſpect to old cuſtoms in agriculture. The gentleman deſpiſes them; the farmer, on the contrary, is attached to them: The reaſon of this difference is not always attended to, though very obvious. The farmer has been educated in the knowledge of theſe cuſtoms, and he has been taught from his infancy to conſider them as the beſt. The gentleman has been taught nothing about them, and he is naturally led to diſregard the opinions of thoſe whom he conſiders as far inferior to him in all kinds of knowledge. Were the farmers more liable to change, improvements indeed would be more eaſily introduced; but as good and bad ſchemes have often the ſame appearance, and can be diſtinguiſhed only by being reduced to practice, in this caſe rents would be worſe paid, and more frequent bankruptcies among the farmers. I mention this, becauſe I would not have it thought that I impute to an unreaſonable obſtinacy, the averſion which the ordinary farmers have to change the cuſtoms in which they have been educated. vid. vol I. p. 7.

* Nam qui ſe in hac ſcientia perfectum volet profiteri, ſit oportet rerum naturae ſagaciſſimus, declinationis mundi non ignarus; ut exploratum habeat,

The following things in the climate ought to be attended to.

The degree of heat and cold, and the time when theſe begin and end.

The quantity of rain that falls, the nature of the ſhowers, and the ſeaſon of the rain.

The keeping a regiſter of the weather in different places with the help of proper inſtruments, would certainly be very beneficial in many reſpects, and particularly would tend much to the improvement of agriculture. Such a knowledge as might be acquired from this, is not to be expected in the farmer. However, from that attention to the weather, which every man is capable of, he may attain a knowledge that may be very uſeful to him, may find out the cauſes of the eſtabliſhed cuſtoms, and thereby have it in his power to improve them.

It is by a proper knowledge of the climate, that the farmer can determine what kind of plants he ought to cultivate, and can regulate the proper ſeaſons for plowing and ſowing. The cuſtoms of the country have in ſome meaſure eſtabliſhed theſe things. But as theſe cuſtoms have been themſelves eſtabliſhed as agreeable to the climate, the more that the farmer acquaints himſelf with it, the more capable he is to improve theſe cuſtoms, to introduce with ſucceſs the culture of new plants, and make alterations in the ordinary ſeaſons of plowing and ſowing. No perſon is ſo fooliſh as to imagine, that all kinds of plants can be cultivated with equal ſucceſs in all climates: it is even vain to imagine, that they can be cultivated with equal ſucceſs in all parts of this iſland, or in all places in the ſame latitude. A very ſmall diſtance ſometimes makes a very great difference in climate, in the degrees of heat and cold, and in the quantity of rain that falls. It is well known, that the climate is much colder upon the higher than upon the lower ground, and that much more rain falls in the Weſt

habeat, quid cuique plagae conveniat, quid repugnet: Siderum ortus et occaſus memoria repetat, ne imbribus ventiſque imminentibus opera inchoet, laboremque fruſtretur. Col. de Re Ruſtica, lib. 1. praef.

Weſt of Scotland than in the Eaſt. Plants therefore which may be cultivated, and ſchemes of management which may be carried on with ſucceſs, in one place, may be very unſucceſsful in another.

Every huſbandman knows, that there is a particular ſeaſon in which every kind of grain muſt be ſown, that it may not be deſtroyed by the cold, and may have ſufficient heat to ripen it. He knows alſo, that his crop depends much upon the nature of the ſeed-time, and upon the ſituation of the land when it is ſown and harrowed. He knows likewiſe, that to make land receive all the benefit of plowing, it ought to be in a proper ſituation when this operation is performed; and that when it is plowed in ſuch a ſituation, it is much more ſecure againſt all injuries from the weather, than when it is plowed in a different ſituation, or is allowed to ly unplowed. Theſe things make a particular attention to the climate of the greateſt importance; and the farmer, who is attentive to this, who adapts the plants which he cultivates to it, who is always ready to catch the favourable ſeaſon as ſoon as it appears, and who is always careful, while he has opportunity, to put his land into ſuch a ſituation as to receive the greateſt benefit from the heat and froſt, and to be beſt fortified againſt the cold and rain, this farmer, whatever is the ſcheme of management which he proſecutes, will be ſucceſsful; while the one that proſecutes any other ſcheme, though the beſt in appearance, that is not adapted to the various changes of the climate, will meet with nothing but diſappointments.

Of the Soil.

In our firſt Volume, ſoil has been conſidered both with reſpect to the tillage that ought to be given, and the manures that ſhould be applied. In this place, it is to be conſidered, with reſpect to the general ſcheme of management, as one of the things that ought principally to be attended to.

Plants

Plants ſhould be adapted to ſoils as well as climates, ſo likeways ſhould the times of plowing and ſowing. In fields lying contiguouſly to each other, we find ſoils very different: We even find this very often in the ſame field. This difference ſhould be attended to, and the fields divided in ſuch a manner, that each field may be as nearly of the ſame ſoil as can be done conveniently. When fields are divided in this manner, plants can be more eaſily adapted to them, and the times of plowing and ſowing more eaſily regulated. Every intelligent farmer knows, that, according to the nature of the ſoil, as it is deep or ſhallow, ſtiff or light, wet or dry, different ſeaſons and different kinds of plowing are neceſſary. He knows likeways, from undoubted experience and obſervations, that particular plants are adapted to particular ſoils. For example, that wheat is the moſt certain crop upon ſome fields, and barley or oats upon others. In the ordinary ſchemes of management, there is a ſucceſſion of different kinds of grain upon the ſame field, and it is obſerved, that almoſt every field has its favourite grain, and that when this grain is ſown, the crop is of all others the moſt certain. But at the ſame time, when this favourite grain is too frequently repeated, it is obſerved, that the crop becomes worſe than it would have been if another kind of grain had been ſown. This makes it neceſſary to attend in a particular manner to the ſoil, that ſo we may know how to indulge it in its favourite grain, and of the various ſchemes of agriculture, proſecuted in the country, we may know to chooſe the one beſt adapted to it.

Of the common practice of the Country.

With ſome perſons it is a neceſſary quality in an improver to deſpiſe the common practice of the country, to conſider the ordinary farmers, as cattle that know not how to leave the tract in which their forefathers have moved before them, and to approve moſt of that ſcheme of management that is moſt

moſt uncommon. It is not neceſſary to do more than mention theſe ſentiments to ſhow their abſurdity. That the general ſchemes of agriculture in Scotland need much to be improved, is indeed a thing moſt certain; but it is as certain, that the deſpiſing theſe ſchemes, and acting upon plans entirely new, is not the proper way to introduce the real improvement that is ſo much wanted.

In the general ſchemes of management practiſed in the country, we find ſeaſons for plowing, and ways of plowing for particular purpoſes; different culture given to different crops; and rules obſerved in the ſucceſſion of crops, in fallowing and manuring: It is improper to aſſert that theſe cuſtoms have been eſtabliſhed by accident; and unleſs a perſon hath examined them with great accuracy, and can clearly demonſtrate that they are bad, he ought to acknowledge at leaſt, that it is poſſible they may have ariſen from experience. It is a certain thing, that the general practice in ſome ſhires in Scotland is different, in many reſpects, from what it was an hundred years ago; and it is poſſible, that the practice an hundred years ago, was as different from the practice in the century preceeding. The attachment of the farmers therefore to their eſtabliſhed cuſtoms ſhould convince us, that every general practice in a country was either neceſſary, or a real improvement when it was introduced; and conſequently, that to reverſe this practice entirely, is to try a dangerous experiment. Could we carry the ſoil and the climate along with the ſchemes which we bring from the ſouth, it ſhall be allowed, that we might, without the ſmalleſt heſitation, reverſe the beſt eſtabliſhed ſcheme in Scotland: Had we theſe at command, we might adapt them to our favourite ſcheme, but, as this is impoſſible, it becomes abſolutely neceſſary to adapt our ſchemes to them; without which, as I have endeavoured to ſhow, we cannot be ſucceſsful. Experience alone can enable us to do this, and, without experience, which cannot be got in a few years, no perſon ſhould, in objects very important, entirely

reverſe

reverſe thoſe practices which, from their being general, we have reaſon to believe have been eſtabliſhed by long experience, as agreeable to the ſoil and climate. To ſhow what reaſon there is for this caution, I ſhall mention a thing, which, as it has frequently happened, muſt have fallen under the obſervation of many. Farmers who have endeavoured to introduce into one part of the country the practices of another part, where the climate and ſoil are different, have, for the moſt part, been unſucceſsful: This makes it probable, that there is ſomething in the climate or ſituation of the ſoil, to which every general practice is adapted, and therefore, if, inſtead of this, another oppoſite practice is introduced, though it may be founded upon the beſt theory of vegetation and tillage, yet, not being adapted to the climate and ſoil, will not prove ſucceſsful. For this reaſon every farmer ſhould be cautious in reverſing eſtabliſhed cuſtoms, and careful to enquire into the reaſons that may have introduced them, as this will enable him to introduce new methods of culture with leſs danger, and more effectually to improve the old.

Upon this plan, in my opinion, the lovers of agriculture ſhould proceed. Inſtead of ſearching England and other places for new methods, for new ſchemes, and new inſtruments of huſbandry, they ſhould endeavour to underſtand the methods, the ſchemes, and the inſtruments we are already poſſeſſed of, to find out in what things they are deficient, and how they may be improved. Inſtead of attempting to introduce one or two wheeled, or two or four coultered ploughs, and complaining of the ſtupidity and obſtinacy of the ordinary plowmen, becauſe they cannot, or will not uſe them, they ſhould ſtudy the mechaniſm of the common plough, learn the uſes of its different parts, and conſider how it may be improved and applied to the different ſoils. Was this plan proſecuted, I am perſuaded, that agriculture would make greater progreſs than it does at preſent.

I ſhould be ſorry, if the cautions given in this and the preceeding

ceeding chapters ſhould be ſo far miſunderſtood, as to encourage any farmers in indolence, or attach them to thoſe old cuſtoms, which now appear from experience to be ill-founded. I had in my view thoſe places of Scotland only, where agriculture is beſt underſtood, and where remarkable changes in the ſchemes of management have been already introduced. Theſe ſchemes are ſtill far from being perfect, and therefore no farmer ſhould ſtop in his endeavours to improve. All that I propoſed in offering theſe cautions, is only to prevent perſons from attempting totally to reverſe the ſchemes practiſed in all places, without a proper attention to all circumſtances, as I am afraid that this practice would rather check than diffuſe the true ſpirit of improvement.

Of the preceeding management of the Farm.

By the preceeding management of the farm is meant, the ſcheme of agriculture that has been proſecuted by the farmer, the particular manures uſed, and the times when they have been applied: The knowledge of this, though not ſo important as the things already mentioned, is however not to be deſpiſed. If the preceeding management of a farm has been attended with ſucceſs, the farmer ſhould not be raſh in changing it, however contrary it may be to his maxims of agriculture: The ſureſt principles of agriculture, as well as of every other art, are thoſe that are founded upon experience. It is from experience that we ought to form them; and therefore a ſucceſsful ſcheme of management is not to be changed, becauſe it may be inconſiſtent with ſome of the principles which we have embraced. On the contrary, we ought to change our principles when we find that they are oppoſed by experience, or cannot be reduced to practice. It is certain that ſchemes of management, ſucceſsful in one place, are ſometimes unſucceſsful in another, though there does not appear any great

difference in the ſoil or climate. Our knowledge of agriculture has not as yet arrived at ſuch perfection as ſome vain perſons imagine. No man, whatever he may pretend, can certainly determine, that a ſcheme, of the goodneſs of which he has even had long experience, will ſucceed in a different part of the country; and therefore when a farmer lays aſide a ſcheme that has been practiſed with ſucceſs upon his farm, and adopts another, though this other may have been practiſed with ſucceſs in another part of the country, yet ſtill it may be ſaid, that he gives up a certainty for hope, and a hope too perhaps not very well founded.

But, although a ſucceſsful ſcheme of management in a farm is not to be raſhly changed, yet certainly it may be improved: And, for this purpoſe, it ought to be attentively conſidered with relation to the climate, the ſoil, the manures uſed, and the particular plants cultivated: For, if theſe things are properly conſidered and attended to, new experiments may be tried with greater ſafety, and alterations made with leſs danger.

The preceeding management of a farm is worthy of our attention, not only when ſucceſsful, but alſo when unſucceſsful. When it is conſidered with relation to the things before mentioned, the cauſe of the bad ſucceſs may be found out, and ſuch alterations made as may rectify the errors that have been committed.

There is another reaſon for attending to the preceeding management of the farm. Manures operate differently: Some of them add vegetable food to the ſoil; ſome exhauſt what the ſoil contains; ſome are quicker, and others ſlower in their operation. It is neceſſary therefore to know what manures have been applied, and at what times, that ſo it may be known what manures are moſt proper to ſucceed, and how they may be moſt properly applied.

Of Oeconomy.

By oeconomy, when applied to a family, is meant ſuch an application of money, and ſuch a management of things purchaſed, as makes the beſt figure in houſekeeping; ſo by oeconomy, when applied to the management of a farm, is to be underſtood ſuch an application of the ſtrength upon the farm as does moſt work, and performs this work to the beſt purpoſe. This, if it is not of all other things the moſt important, is however ſo important, and ſo little attended to by thoſe who have attempted improvements, that it needs to be very particularly inſiſted upon.

By oeconomy the expence of management may be greatly leſſened, and the work too better performed. The leſſening the expence of management is an object of great importance, and is every day becoming more ſo; for this expence is every day becoming greater, and bearing a higher proportion to the produce of the farm. If it had been increaſed by theſe things only, which in the ſame proportion increaſe the value of the crop, the leſſening it would not have been an object of greater importance than formerly: But this is not the caſe; this expence has been occaſioned by the increaſe of taxes, and a variety of other things which contribute but little to increaſe the value of the crop.

There are a variety of things neceſſary in the management of a farm, that are expenſive to the farmer. The principal of which are, Timber, Iron, the expence of ſmith and wright-work, the wages and maintenance of labouring ſervants, and the price of labouring cattle. When the expence of managing a farm at preſent is compared with what it was about thirty years ago, a remarkable difference appears. There is not one of the articles mentioned that is not greatly heightened to the farmer, and there are ſome of them, and theſe too the moſt important, that are more than doubled. Many things have contributed to heighten this expence. The in-

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creaſe of trade and manufactures, the improvements carrying on in agriculture, and the exportation of uſeful hands to the plantations, occaſion a demand for labouring ſervants, which has naturally heightened their wages; and luxury, which has deſcended to the loweſt claſs of mankind, and become almoſt univerſal, has, in the ſame proportion, heightened the expence of their maintenance. The great increaſe of taxes, increaſing the neceſſary expences of the tradeſman and manufacturer, has obliged them to raiſe the price of their labour. The increaſe of Currency, occaſioned by the national debt, and the many banks lately eſtabliſhed, has raiſed the price of every commodity. This laſt indeed has produced no diſadvantageous change upon the whole, as it has raiſed the value of the produce of the farm, in the ſame proportion as it has raiſed the expence of management. But the other things, on the contrary, have greatly raiſed the expence of management, while they have but little effect in raiſing the value of the produce: And indeed that has now arrived at ſuch a height, as to make it abſolutely neceſſary in the farmer to give the greateſt attention to oeconomy in all his operations.

The principal thing in oeconomy is to have an uninterrupted ſucceſſion of uſeful labour during all the ſeaſons of the year. In order to this, there muſt be a proper ſcheme of management; the farm muſt be properly laid out, and proper attention given to the times of plowing.

The ſucceſſion of labour muſt be kept in view in every ſcheme that is propoſed: For it is certain, that a ſcheme, though moſt ſpecious upon paper, and which might ſucceed very well if we had ſtrength at command, and were obliged to pay for labourers and labouring cattle only when we uſed them; yet, if it requires more labour at one time and leſs at another, than the ordinary ſchemes of managment, will upon trial be rejected. The reaſon is plain, the additional ſtrength that this ſcheme requires is a certain expence, while the advantages

pro-

propoſed are uncertain; and if there is no additional ſtrength, the work cannot be performed in its proper ſeaſon, and on that account no great advantage can be expected from it *.

The ſucceſſion of labour moſt likewiſe be kept in view in the way of laying out the farm into breaks. It ſhould be laid out in ſuch a manner, that each field, if poſſible, ſhould contain only one kind of ſoil, and if there is both wet and dry land in the farm, matters ſhould be managed in ſuch a manner, that there may be a part of both kinds for every grain that is cultivated in the general ſcheme of management. If a farm is laid out without any regard to this, it may happen that there ſhall be nothing but wet land for one kind of grain, and nothing but dry land for another. The diſadvantage of ſuch a diviſion is obvious: The time of plowing the wet land, may fall in with the rainy ſeaſon, and thereby an entire ſtop be put to the labour, or the work very ill performed. On the other hand, when the farm is laid out in ſuch a manner, that there is a proportion both of wet and dry land for every grain, then there is always ſome of the land in a proper condition for being plowed, and there is never any neceſſity either for delaying the work, or performing it improperly.

The giving proper attention to the times of plowing, is another thing which I mentioned as of conſequence to have a ſucceſſion of labour. In many farms there are fields that much rain or ſevere drought reduce to a ſituation improper for being plowed. The attending to the proper time for plowing theſe, is of great importance. The farmer that goes on plow-

* In the ſcheme of management commonly practiſed in Eaſt Lothian, there is a proper ſucceſſion of labour. After harveſt the barley land gets the firſt furrow, and the wheat ſeed is ſown; after theſe, the land is plowed for the oats and peaſe, and the ſeed ſown; then the barley land gets the ſtirring furrow; and after that, is ſeed-furrowed and ſown. In ſummer the fallow is plowed, foreign manure provided, &c.

plowing for the different grains in their order, and the different fields as they ly moſt contigiuous, without any regard to the wetneſs or dryneſs of the land, will frequently find, that he muſt put a ſtop to his work, or, what is worſe, plow his land in bad order; whereas the farmer that attends to the ſituation of his fields, and, before the wet ſeaſon comes on, plows ſuch land as is in the greateſt danger of being rendered unfit for being plowed by two much water; and, before the dry ſeaſon ſets in, plows the land that is in the greateſt danger of being rendered unfit for being plowed by too great drought, will ſeldom be ſtopt in his work, and will ſeldom be obliged to plow his land in an improper ſituation.

This oeconomy which I have been inſiſting upon, is of ſo very great importance, that I am perſuaded it is the giving a proper attention to it that chiefly diſtinguiſhes the good from the bad farmer. The ſeaſons for plowing and ſowing, the particular plants proper for the ſoil, and the manner in which the different crops ſhould ſucceed each other, are determined by the practice of the country: But it is the farmer's own diligence, and his judgement in timing his work, that produces that oeconomy by which he makes the moſt of the ſtrength of his farm, and performs his work to the beſt purpoſe. It is this therefore that chiefly diſtinguiſhes the good from the bad farmer: And though it is certain, that one ſcheme of management is much better than another, yet, at the ſame time, it is as certain, that the farmer who neglects oeconomy ſhall not proſper with the beſt ſcheme, while he who obſerves oeconomy, with a ſcheme greatly inferior, ſhall be ſucceſsful.

ARTI-

ARTICLE II.

The FARMER's KALENDAR; or, a Monthly Directory for all ſorts of Country Buſineſs; containing plain inſtructions for performing the work of various kinds of farms, in every ſeaſon of the year. Reſpecting particularly, The buying, feeding, and ſelling live ſtock—The whole culture of arable crops—The management of graſſes—The oeconomical conduct of the farm, &c. *By an experienced Farmer.*

ONE of our correſpondents, to whoſe judgment we owe ſome deference, obſerving ſome very uſeful inſtructions taken into our former volume, [Vol. I. p. 125.] from this valuable work, has ſuggeſted, that it might be of very great utility to the Farmers of this country, to have a regular KALENDAR ſet before them, to direct the courſe of their operations through the whole year: And that although this work is calculated for the meridian of England, whereby the works there preſcribed are rather a month too early for our climate, and that ſeverals of the articles relate to the more improved ſtate of Agriculture in that happy country; yet the SCOTS FARMER may reap conſiderable advantages by it, if he carries a little attention and oeconomy along with him in his operations †, and thereby obviate the firſt objection; and the ſecond he thinks may be avoided, by your leaving out ſuch articles as will not apply to our preſent ſtate of Scots Agriculture, or are not intereſting to the SCOTS FARMER.

Reſolving to comply with this requeſt, We here preſent our Readers with the *Introduction* to that Work, and in our next Number, ſhall give the *Kalendar* for *January*, under the foreſaid caution; and, if it is approved of, ſhall continue it through the whole months of the year, under the caution given us by our correſpondent.

† See the 11. page of this number.

INTRO-

INTRODUCTION.

GARDENERS have found great uſe in Kalendars of the neceſſary work for every month in the year; and, if the two profeſſions be well conſidered, it will appear, that FARMERS want ſuch a remembrancer, at leaſt as much as their brethren in the garden.

The enquiry is not the utility of ſuch a work to old, experienced, and good huſbandmen; becauſe no country is cultivated by ſuch alone; but to younger and leſs able ones, ſuch a work cannot fail of being an uſeful companion.

At the beginning of every month, a Farmer, whether he has or has not a book of this ſort, ſhould reflect on the work to be done in that month: he ought to foreſee the whole, or elſe it is impoſſible he ſhould make a proper proviſion for it.

Now I leave to any one to judge, if this juſt idea can be gained ſo eaſily, and be ſo complete, without ſome further recollection than mere memory; and if a book of this ſort but once in a year reminds him of ſome important work, which he would otherwiſe have forgotten, it will by every one be allowed to pay him ample intereſt for the ſmall ſum that is requiſite to purchaſe it.

I hint this, becauſe common farmers are generally poor, at leaſt in what concerns the purchaſe of many things they think ſuperfluous; I would therefore ſhew them, that a book may be of ſome uſe: a truth they will not all acknowledge.

As to the Kalendars which have hitherto appeared, they are very ſlight ſketches; added to other books; extremely imperfect, omitting at leaſt as many uſeful articles as they have given; in works of high prices; and, in a word, ſcarcely in the leaſt inſtance precluding the want of ſuch a book as is now offered to the publick.

About fifty years ago, a celebrated Engliſhman, Mr Tull, made many experiments, in a new method of culture, the great

great deſign of which was to ſet aſide the uſe of manures. To this day he has had many followers. With the gentlemen that purſue his ſyſtem, tillage alone is neceſſary—the plough is all in all, and nothing is to be dunged, or otherwiſe dreſſed, but meadows or paſtures. Were ſuch ideas to become general, it is inconceivable how much miſchief they would occaſion; for there cannot be more falſe principles, than thoſe whereon they are built. Throughout theſe ſheets, care is taken to keep clear of ſuch errors. The great importance of manures is duly attended to, and the farmer well inſtructed how to raiſe as much as poſſible himſelf. This part of husbandry can never be too much attended to, nor can any have been more neglected by the generality of writers; indeed, except by one or two, (who it muſt be owned have treated it in a very maſterly manner) they have not thought it worthy their attention.

There is another point in which all the old writers of huſbandry are totally deficient; it is that of farmers keeping accounts; this is a matter of very great conſequence; and, as the monthly directions could not include it, it will be proper to be a little particular on it here.

It is not long ſince a ſpecimen of accounts was laid before the public, conſiſting of ſeveral books, in imitation of merchants accounts; but I humbly think, that too complicated methods ſhould not be recommended, leaſt the farmer, inſtead of being enlightened, ſhould only be diſguſted. The grand object is to keep a Ledger, or account for every article in the farm; in which an account ſhould be opened, for every field in the farm, or at leaſt for every arable field, and one for all the graſs. The farmer ſhould in this book directly, without the intervention of a waſte book or a journal, enter all his expences; but, for doing this, he muſt take the trouble of dividing his rent to every field, ſo that the account may be complete, and not have an article for rent alone, unleſs it be a mere memorandum; and before he ballances his books at the end

of the year, it is neceſſary for him firſt to caſt up the ſundry accounts, ſuch as tythe, poor levy, various expences, and divide them in the ſame manner as rent.

To explain this, let us ſuppoſe, that under the article tythe he enters the round ſum he pays the parſon this year, (which may vary the next) as it is for all his tythes, graſs, arrable, ſmall tythe, &c. It is a groſs expence for the whole farm in general, and therefore, if it comes to L. 100, and he has 400 acres, he ſhould enter it 5 *s.* per acre to every field. In the ſame manner, the poor tax, and other pariſh charges, ſhould be managed: theſe vary every year; at the end, the ſum total ſhould be divided among the acres, and charged to each field. Another article is, the ſundry expences, ſuch as odd labour that concerns no particular account, bailiff's wages, expences at market, and, in a word, all money ſpent that cannot be properly placed to diſtinct accounts. The ſum total to be divided as above. Fences are another article, which ſhould be thus divided. When this method is followed, the farmer has it always in his power to ſee the real profit and loſs of every field, which is a point of great conſequence. He can then at any time, by turning over his book, ſee what courſes of crops have paid him beſt; he may diſcover in this manner, that in ſeveral fields of the ſame ſoil, ſome courſes have paid him far better than others. For inſtance, he finds that a ten-acred cloſe, thrown into the ſyſtem of, 1. Turnips, 2. Barley, 3. Clover, 4. Wheat, has paid him at the end of eight years L. 126 - 18 - 4. And that other ten acres, thrown into 1. Fallow, 2. Wheat, 3. Barley, 4. Oats, paid him, in that time, no more than L. 68 - 16 - 2. He ſees at once how greatly preferable one courſe is to the other, and not only from a general vague idea, but a clear ballance ſtruck between them. In the ſame manner, he compares all his ſorts of cattle, and ſees at one view which anſwers beſt. No perſon can doubt of the great advantages of this conduct being carried through a farm: it is what has properly been explained by no author, but, to

make

make it perfectly ſimple and plain to the capacity of the loweſt farmer, it would be neceſſary to give more minute examples than are proper for this introduction.

The advantages, which muſt follow ſo accurate an attention to huſbandry as a Kallendar leads to, with a due conſideration of the importance of regular farming accounts, brings me to offer a word or two on the profit of huſbandry when properly conducted. Whoever will give good attention to improvements, will find it a buſineſs yielding better intereſt for money, than any other, and at the ſame time wonderfully healthy and agreeable: It is in every ſcale, from the largeſt tenures down to the leaſt farms, nearly connected with all the enjoyments of a country life, with houſe keeping, horſes, equipage, ſporting, &c. &c. And if there is the leaſt prudence in the management, many advantages of every kind may be reaped, without falling into dangerous expences.

The benefit of being able to employ ſmall ſums of money is peculiar to huſbandry. What trade can be ſet up without introduction or partnerſhip, in which a man can employ five hundred pounds? In moſt, he muſt have nearer five thouſand; but in huſbandry, a young man, that is not extravagant, and will mind his buſineſs, may, on ſuch a farm as L. 500 will ſtock, live very agreeably; for it will fix him on eighty or an hundred acres of good land, which will yield him an annual profit of from L. 100 to L. 200 a year clear, or from 30 to 40 *per cent*, for his money.

But when I ſpeak of ſuch a profit, it is to be underſtood, that I mean by following a ſomewhat better huſbandry than common. Bad common management will not yield ſo great an advantage, but improved methods change the caſe greatly; not however that I would by any means recommend his deviating in the expenſive gimcrack parts of huſbandry, which are fit only for gardens or experiment-grounds; but merely to adopt the culture of ſuch plants as will pay well for an accurate management *in large*. I have mentioned his farming

farming ſo little as eighty or an hundred acres; but a much ſmaller quantity may be profitably managed, and yet a team kept.

A good farmer will always remember, that there is more profit in a maſterly cultivation of a few acres, than in the ſlovenly conduct of many.

Lucerne, cabbages, carrots, and potatoes, may every where be ſafely introduced, excepting certain ſoils, few in number, that are improper for ſome of them. If the culture of theſe plants is purſued, a team may be employed on a very ſmall farm with advantage; but, as manuring of all ſorts is of infinite conſequence, eſpecially to theſe luxuriant growing plants, a ſmall farm, on which they are introduced, would be particularly profitable, if ſituated within reach of a town, where manures could be purchaſed; becauſe then all the time not wanted in tillage, &c. might be employed in bringing dung, &c.

To ſtate a caſe, which will explain this idea, and illuſtrate ſome particulars in the enſuing pages: Suppoſe the team of a little farm to conſiſt of four horſes, and the diſtance from purchaſed manure ſuch as admits of one journey every day, the expence may be ſtated as follows.

	£.		
Keeping 4 horſes a year, excluſive of ſummer food,	40	0	0
1 Man,	25	0	0
Wear and tare,	20	0	0
300 Waggon loads of manure, at 5 *s.*	75	0	0
Beer for the man, and turnpikes, 300 journeys, at 1*s.* 9*d.*	26	5	0
Total	186	5	0

300 waggon loads.
600 cart, at 6*s.* 3*d.* a load.

This

This is the price, at which he would get the manure, whether he thus employed the team a whole year at it, or only a part.

Suppose the farm consisted of five acres of lucerne, five of natural grass, and thirty-five of arable land thrown into the following course: 1. Potatoes, 2. Carrots, 3. Cabbages, 4. Barley, 5. Clover, 6. Clover, 7. Wheat. Ten acres every year of clover, and five of each of the other crops. And suppose further, that the potatoes, carrots, cabbages, half the clover, and the lucerne, every year manured as above, with 12 loads an acre, at 6*s*. 3*d*. In this case the expences per acre would be nearly as follows: The lucerne, 6 *l*. the cabbages, 7 *l*. the potatoes, 8 *l*. and 10 *l*. more for buying lean hogs to fat. The carrots 10 *l*. and 20 *l*. more for buying hogs to fat; The wheat 3 *l*. 15 *s*. the barley, 3 *l*. 15 *s*. the clover half at 4 *l*. 14 *s*, and a half at 1 *l*. 10 *s*. the grass at 1 *l*. 5 *s*. rent and charges.

All expences whatever are included in these sums.

Expences.

	£.		
5 acres of lucerne, at 6 *l*	30	0	0
5 of cabbages, at 7 *l*.	35	0	0
5 of carrots, at 30 *l*.	150	0	0
5 of potatoes, at 18 *l*.	90	0	0
5 of wheat, at 3 *l*. 15 *s*.	18	15	0
5 of barley, at ditto,	18	15	0
5 of clover, at 4 *l*. 14 *s*.	23	10	0
5 of ditto, at 1 *l*. 10 *s*.	7	10	0
5 of grass, at 1 *l*. 5 *s*.	6	5	0
Sundry labour in carting it home, &c. &c.	30	0	0
Total	£. 409	15	0

Product

Product.

Product of 5 acres lucerne, and 5 cabbages; the keeping 17 cows, at 6 *l.* per cow,				£.	102	0 0
5 acres carrots, at 700 bushels per acre; 3500 bushels, at 6 *d.* per bushel.	£.	87	10 0			
Prime cost of the hogs.		100	0 0			
					187	10 0
5 acres potatoes, at 500 bushels per acre, 2500 bushels, at 9*d.* per bushel	£.	93	15 0			
Prime cost of hogs		50	0 0			
					143	15 0
5 acres of wheat					40	0 0
5 of barley,					35	0 0
10 of clover, 5 loads hay at 30 *s.* 7 *l.* 10 *s.*					75	0 0
The grass for the horses						
Total,					583	5 0
Expences,					409	15 0
Clear profit,					173	10 0

There can be no doubt, but this cultivation might be realized in any place, the situation of which would admit the above suppositions. The crops are large, but not too great for such most uncommon improvement by manuring. Here we see how great a profit may be made by a spirited husbandry on a small space of ground; but common farmers will never equal any thing of this sort, for want of attending more to useful books, which point out the culture of these valuable plants, and direct their management. This instance shews the importance of attending well to husbandry, under certain improvements, which render it so much more profitable than most other businesses. An employment of money, that will allow of such great advantages, much deserves a little more than the attention of common farmers. It is to be hoped, that this Kalendar will assist in such undertakings, and not be turned

turned to in vain by others, who deſign to purſue only the uſual ſyſtem of management.

Huſbandry is an art ſo extremely various in its operations, its profeſſors have ſuch a perpetual call for their attention, and every month brings ſo many works, that muſt be executed in a given time, and ſome of them almoſt to a day, that ſcarcely any buſineſs requires a better memory, none a ſtricter obſervance of ſeaſons. An old experienced farmer may not want a Kalendar, to remind him of the work neceſſary to be done, in every month, upon the generality of farms; but to younger ones, and the whole tribe of gentlemen farmers, ſuch a companion cannot be altogether uſeleſs.

Huſbandry has, for many years, been my only buſineſs; and the work, now publiſhed for the uſe of my brother farmers, is actually an enlargement of a manuſcript originally drawn up for my own uſe. I found the benefit of ſuch a monitor ſo great, that, for ſeveral reaſons, I kept adding freſh particulars, as they occurred in the practice of my buſineſs, and have ever ſince experienced no ſlight advantage from often turning over my Kalendar, to ſee if I had the works of the ſeaſon in hand.

I have been as conciſe as I could in the directions how each buſineſs is to be performed. Some inſtructions of this ſort were neceſſary for the young practitioner; but it was likewiſe neceſſary to keep ſuch parts within due bounds, and not ſwell them with all the minutiæ of Farming.

ARTI-

ARTICLE III.

Scheme of Horſe-hoeing Huſbandry

[In a Letter to the PUBLISHER.]

IT is propoſed to labour a Farm of 340 acres, of which 240 to be perpetually in Wheat, 50 to be in Corn and Peaſe, and 50 to lye in Graſs. Theſe two fiftys to be changed alternately according to the country method: The whole dung in the Farm, and manure that can be collected from abroad, to be laid on the graſs, in order to enrich it for being broke up in its turn.

Quær. What ſtrength of men and horſes will be ſufficient for this purpoſe?

Reſp. Six men and ſix horſes through the whole year, and two men and four horſes from the beginning of September to Martinmas: but as the man who labours conſtantly with ſix horſes muſt keep ſeven in order to make the calculation eaſier, we ſhall ſet the whole at eight horſes and ſeven ſervants for the whole year.

Expence. To avoid further the trouble of calculating the expence, which muſt vary according to the price of labour in different countries or parts of a country, we ſhall allott the 100 acres of corn and graſs to maintain the horſes and ſervants, and pay wages; and to pay rent, and furniſh ſeed for theſe 100 acres.

This being premiſed, the charges on the hoed cropts are as follow:

1. The rent of the ground is uncertain; but ſuch as will produce the crops to be after-mentioned is not worth more, as ground is commonly let, than ten ſhillings per acre.

N. B.

* This ſcheme was ſent us by a correſpondent, who aſſures us it was practiſed by an actual farmer, who ſtill continues the practiſe: But he has not favoured us with his name, or the country where he reſides.

N. B. The higher the rent the more profit will accrue to the farmer, provided the ground be anſwerable in richneſs to the increaſe of the rent.

Inde for 240 acres	£. 120	0	0
2. A ſtock of *l.* 500 is ſuppoſed neceſſary for beginning this undertaking, the intereſt of which, at 10 *per cent.* for the capital ſunk, is	50	0	0
3. Eight horſes valued at *l.* 90, on which 15 *per cent.* for tear and wear	13	10	0
4. Carts, ploughs, harrows, drills, and all other tackling, the value of which may be *l.* 80, on which 15 *per cent.* as above	12	0	0
5. Seed wheat, at 3 pecks to the acre, being 45 bolls, at 15 *s.* per boll	33	15	0
6. Hand-hoeing and weeding the wheat rows. This expence cannot eaſily be computed, as it decreaſes every year; but may be ſet at 2 *s.* 6 *d.* per acre	30	0	0
7. Cutting down the wheat crops at 2 *s.* 6 *d.*	30	0	0
8. Threſhing out, at a twenty fifth part of the crop, 48 bolls wheat, price as above	36	0	0
Total expence	£. 325	5	0

Per Contra.

By 1200 bolls wheat, which, computing at 5 bolls per acre, and ſetting grain and fodder at 15 *s.* per boll,	£. 900	0	0

This calculation comes out ſo large on the profit ſide, that a deduction may be made from the crop as an addition to the expence of management, leaving ſtill a reaſonable reward to the farmer for his ſkill and labour.

The proportion of ground to the ſtrength of men and horſes above required, ſo much exceeds the allowance in the common method of labouring, that it ſeems to need decyphering.

EXPLANATION. The foregoing ſcheme depends upon the moſt favourable ſuppoſition both as to ſoil and climate. That from the firſt of March to the middle of July, the ground may be dry enough to allow five days plowing each week, taking one with the other, during the ſeaſon. The beſt ſoil for this huſbandry is a loam or black earth upon a ſandy bottom; and in ſuch a ſoil, and upon the eaſt coaſt, the allowance of five days in the week may be given. In more rainy climates, or wetter ſoils, a deduction muſt be made. But be the ſoil and climate what they will, each of the ſix horſes employed in the ſummer plowing takes on eight acres of wheat for each plowing day allowed in the week, over and above the quantity of ground allowed for labouring in the common way as above: That is to ſay, allowing five plowing days in the week, each horſe takes on 40 acres of wheat: Allowing four days only, 32 acres; and ſo on to one day in the week.

Suppoſe the 240 acres dreſſed in five foot ridges, and the cropt drilled in two lines upon the top of each ridge, the partition or empty ſpace between theſe two lines being ſix or eight inches; and a deep furr or trench between every two ridges: the bringing the ground into this ſhape will, no doubt, take both time and expence: but the expence being in proportion to the ſituation and nature of the ſoil, and alſo to the ſkill, induſtry, and abilities of the farmer, cannot be eaſily calculated; part of the L. 500 ſtock allowed muſt be applied here.

The ſtrength ſuppoſed for the ſpring and ſummer plowing being ſix horſes, mounts three two-horſe-ploughs; each plough in eight hours going, by turning the furrow from the wheat, to make a veering in the interval where the trench was before, plows three acres. Thus every plowing day clears nine acres; and conſequently the given acres are done over for the firſt time in ſomething leſs than 27 days—The ſecond plowing or horſe-hoeing throws this veering to the wheat rows on both ſides, and is performed by a plough having a mold-board on each

each ſide. This plough requires three horſes, and throws out in this manner ſix acres in a day; conſequently two of theſe ploughs turning twelve acres every day, go over the whole in 20 days.—The third plowing is performed as the firſt; and the fourth as the ſecond; 94 days being the time it takes to finiſh the whole operation. But the plowing days between the firſt of March and middle of July, computing at five days each week, are 98.

The plowing neceſſary to form the ridges for the ſeed cannot ſo eaſily be computed, I mean proportioned to the ſtrength; as the labour of the four additional horſes between the months of September and November muſt be applied here at ſuch times as they are not employed in carrying home the cropt which is uncertain. When the veerings are formed, whereon the next cropt is to ſtand, we throw them in with a ſtrong plough, to which we put three horſes, at two large furrs; and the Hintings on which the laſt cropt ſtood, are thrown out by the double-mold-board plough.

Theſe Hintings can be thrown out in the wetteſt weather; ſo that we reckon we can plow all the ſix days in the week in the goe-harveſt. The reaſon we take three horſes to form the veerings for the next cropt, is, to give it a greater depth, becauſe upon the heighth and fineneſs by pulveration of this veering, depends in a great meaſure the goodneſs of the enſuing cropt,

In general, ſixty days plowing of the ploughs forms the ridges, twenty days harrowing with two horſes, and twenty days drilling with a ſingle horſe, finiſh the whole.

As to the hundred acres propoſed for the common method of labouring, theſe are to be one half in graſs, and the other in ſpring cropts alternately; ſo as theſe cropts muſt have but one plowing between Martinmas and the beginning of March, that there may be no interference with the horſe-hoeing: All the dung and manure that can be got ought to be laid upon the graſs. And as the two hundred and forty acres in wheat require

require no dung, but on the contrary add greatly to it, it is ſuppoſed that the corn cropts, on breaking up the graſs, will not be inconſiderable.

Schemes may no doubt be formed, for improving this part of the plan; but as theſe would require a greater number of horſes, they do not properly fall within this deſign, which is to ſhow how much more ground may be cultivated in this way, than can be by the common methods with the ſame ſtrength, and how much better cropts may be obtained.

As I have ſtated the expence high, ſo I have brought the cropts low both as to value and quantity. As to the value it is to be noticed, that the horſe-hoed wheat is always 1*s* 6*d*. or 2*s*. per boll better than the common wheat. And as to the quantity to be got from an acre, I ſhall relate my own experience, which is from a field of eleven acres, one third whereof is very rich ground, about a half middling ground, and a ſixth, very bad thin ſoil, and on a bottom of pure ſand. The whole may be called a dry friable ſoil; But the lower part is ſubject to be overflowed by a river, and is the richeſt. When it came out of the tenant's hands I ſowed it with oats broad-caſt; the ſecond cropt was beans and peaſe in the ſame way; the third was drilled barley for hand-hoeing; the fourth was horſe-hoed barley; and till now that the eight crop is ſtanding on it, it has been kept in horſe-hoed Wheat. About two acres of the lower part of it was trenched the firſt year; but none of it has got any dung or manure ſince the tenant left it. The horſe-hoed barley had four bolls the acre; the firſt of wheat ſix bolls, the ſecond five only, for the overflowing of the river had damaged the lower part conſiderably; the third cropt of wheat had ſeven bolls; and the preſent cropt, 1759, looks ſtill better than the laſt. It comes out $7\frac{1}{4}$ bolls.

I had the curioſity to try what was the difference of the produce of the beſt and the worſt of the ground laſt year: I found twelve bolls on the acre of the beſt, though all the ground is continually under the ſame culture and management. I judged

the

the middling ground to carry from four to ſix bolls per acre, but made no trial. This may be a leſſon to the farmer to chooſe well the ſoil he propoſes to cultivate in this way.

I ſhall conclude with obſerving, that farmers ought not to embarraſs themſelves too much with the new philoſophical diſſertations on vegetation, that ſeem to be coming into vogue at preſent. Theſe gentlemen appear to be leſs anxious to inſtruct the farmer how to get good cropts, than to inform him of what materials God Almighty makes plants—a ſubject, I preſume, they will not ſoon be maſter of. The philoſophical tenets, neceſſary for a farmer, may be reduced to four heads.

1*ſt*, That the ſpreading and encreaſing the roots of his plants augments the cropts.

2*d*, That deep and frequent plowing facilitates the ſpreading and increaſe of the roots.

3*d*, That turning the ſurface frequently up to the ſun and air, eſpecially in ſummer, adds to the fertility of his ſoil.

4*th*, That there is a certain proportion of ſeed and number of plants, which will bring the greateſt cropt on a given quantity of ground; and he ought to endeavour to find theſe out, and to apply the whole ſtrength of his ground to his cropt only, taking care to deſtroy all intruders that endeavour to come in for a ſhare of it.

ARTICLE IV.

Of the miſapplication of Lime.

[In a Letter to the PUBLISHER.]

I am one of the readers of your uſeful Miſcellany, and highly approve of your ſcheme. By collecting a number of obſervations and experiments drawn from real practice in different parts of the kingdom, a practical ſyſtem of agri-

enlture

culture may be formed, infinitely ſuperior to any of the fine ſpun theories we daily ſee publiſhed. I obſerve, you have ſeveral valuable correſpondents in Eaſt Lothian, [Vol. I.] whoſe real practice (from my own knowledge) agrees exactly with what they have laid before the publick. But although we are got pretty much into the ſpirit of improvement in this part of the country, and you have many readers here, yet, ſo far as I have obſerved, you have not one correſpondent.

Permit me, therefore, to throw in my mite, and to lay before the public ſuch obſervations as occur to me in practice, which may induce others of much greater abilities to do the ſame. If the following remarks on the management of lime meet with a candid reception, I ſhall continue my correſpondence, and ſend you my obſervations on any other ſubjects that may merit your attention.

The principal manure we uſe here is lime; which is found to pay exceedingly well, though at the diſtance of ſixteen or eighteen miles: It coaſts us, including carriage, 7. *s* 6. *d.* or 8. *s.* the cart load *. Though this expence be very great, it is often, in a great meaſure, thrown away by an improper management. Some, out of a view to outſhine their neighbours, or other miſtaken notion, undertake more in a ſeaſon, than they are able to accompliſh, and drive lime as long as the weather permits; ſo that, in the latter end of the year, when they intend to ſpread it, wet weather ſets in, and prevents them. Perhaps the land is level, or in the croſs

* We beg leave to notice to this, and to all our correſpondents, that the expreſſion of *a cart load* is rather too indefinite to convey a determined idea; carts are uſed of various dimenſions, and when cart-loads are mentioned, the quantity of firlots or buſhels they contain, or with which they are commonly loaded, would then fix the preciſe quantity of lime or dung, &c. that is meant to be expreſſed. Lime is generally ſold in this country by the wheat firlot or buſhel.

croſs furrow, and therefore both lime and land (unleſs a very dry ſoil) is obliged to lye ſouring all the winter ſeaſon: Whether the lime loſes any of its good qualities in ſuch a ſituation I ſhall not pretend to determine; but ſure I am, that land lying wet all the winter after fallow, when plowed in the ſpring, is very unfit for vegetation, and the lime will prove of little or no effect the firſt year.

There is another way in which a great deal of lime is loſt, which is, by ſpreading it on the land when there is too much wind: By this means, the fineſt particles of the lime are carried away, and the owner hath nothing left but the groſſer parts, which are leaſt fit for his purpoſe.

The alteration of ridges (even in very dry land) often proves the deſtruction of a great deal of lime. To level high ridges, and lime them that ſeaſon, is a very great loſs, which I have felt by experience; the furrows of the old ridges is looſe earth to a certain depth, and the lime is carried by the rains to the bottom, where it is entirely loſt, and it will prove of little or no uſe to the crowns of the old ridges, which, having been deep hid, have never had the benefit of the air (ſo neceſſary for vegetation); that, until they be expoſed to it for a conſiderable time, no manure can be of any great ſervice to them.

To prevent theſe loſes, high ridges ought to be levelled gradually if the land is in tillage, ſome years before it is fallowed for lime; or if it is coarſe outfield, it ought to be fallowed two years, as it is much better to loſe a crop before lime than after it, and run the riſk of loſing the lime alſo.

Land thus managed, the new ridges ought not to be made high, becauſe where the furrows of the new ones happen to be on the crowns of the old ones, they will be quite deprived of ſoil. And when the land is limed on the level, the new ridges ought not to be gathered oftener than once, that is to ſay, the crowns this year to be made the furrows

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the next; and the wetter the land, the narrower they ought to be. Ridges ſix feet wide, if properly water furrowed, will be as dry as thoſe gathered to a conſiderable height; for although a piece of the crowns of high ridges may be dryer, the furrows will be wetter; and upon the whole, the narrow ones will be dryer, and plow ſooner after wet weather.

Near KELSO. R. G.

ARTICLE V.

On Brining Wheat.

THE following receipt will aſſuredly prevent the ſmutt, and render both the ſowing and drilling of the wheat much more eaſy and certain, (I mean as to the quantity) than any other method hitherto practiſed, that I ever heard of, by the following pickle.

A tub is to be procured that has a hole at bottom, in which a ſtaff and tap-hoſe is to be fixed over a wiſp of ſtraw, to prevent any ſmall pieces of lime paſſing (as in the brewing way); this done, we put 70 gallons of water, then a corn buſhel heap-full of ſtone-lime unſlaked, ſtirring it well till the whole is diſſolved or mixed, letting it ſtand about 30 hours, and then run it off into another tub as clear as we can, (as practiſed in beer); this generally produces a hogſhead of good ſtrong lime water; then add three pecks of ſalt, 42 pounds, which, with a little ſtirring, will ſoon diſſolve; thus we have a proper pickle for the purpoſe of brining and liming our ſeed wheat without any manner of obſtacle, which is more than can be ſaid, in doing it the common way, and greatly facilitates the drilling.

Herein we ſteep the wheat in a broad bottomed baſket of about 24 inches diameter, and 20 inches deep (for large ſowings made on purpoſe) running in the grain gradually in ſmall

ſmall quantities from 10 to 12 gallons, up to 16 gallons, ſtirring the ſame; what floats we ſkim off with a ſtrainer, and is not to be ſown, then draw up the b ſket to drain over the pickle for a few minutes, all which may be performed within half an hour, ſufficiently pickled, and ſo proceed as before. This done, the wheat will be fit for ſowing in 24 hours, if required, but if deſigned for drilling, two days pickled will be found beſt, and if prepared four or five days before hand, in either caſe it makes no difference at all that I know of; but ſhould the ſeed be clammy, and ſtick to the notches in the drill box, more lime muſt be added to the lime water; here the maſter muſt uſe his diſcretion, as the caſe requires, for ſome lime has much more drying or aſtringent qualities in it than others——If ſea-water can be obtained conveniently, much leſs ſalt will ſuffice, but ſome will be found neceſſary even then, otherwiſe the light grains will not float, a thing of more conſequence than is generally imagined, and ought to be ſkimmed off and thrown aſide for poultry, &c.

I ſay this from well grounded experience, having practiſed theſe methods for 30 years paſt, and never had any black wheat when prepared as above, either from ſowing or drilling, on great variety of ſoils, and large quantities too, all which is confirmation enough to continue its practice; and thus, ſeeing its utility, I throw another mite into the noble treaſury of arts, &c. for the benefit of my countrymen, which I truſt will be acceptable.

P. S. On experiment, it has been found, that wheat may be ſown in two hours after being put into the brine, provided the brine is ſtrong enough, and due attention is paid to the ſtrength of the lime water.

ARTICLE VI.

Of the management of Horſes employed in the Works of Husbandry.

[From the MUSÆUM RUSTICUM, Vol. I.]

UNdoubtedly the Horſe is the moſt uſeful creature we have: it is therefore well worth our while to be attentive to his health.

I have always had a particular regard for this noble animal; and it has been my conſtant endeavour, to make his neceſſary ſervitude as eaſy and comfortable to him as poſſible.

Horſes are naturally lovers of liberty, and we ought, in gratitude, to allow them as much of it as is conſiſtent with the work we ſhould reaſonably expect from them.

Moſt of the diſorders to which they are ſubject ariſe from the too great reſtraint they are kept in *. What can be harder than, after working them eight or nine hours, to tie them up with a halter in a ſtall not more than four feet wide, and perhaps ſeven or eight long, there to remain for the reſt of the day and night? whereas, had they their liberty, at leaſt a reaſonable ſhare of it, allowed them, they would much ſooner recover their fatigue, and enjoy by far a better ſhare of health.

This I know to be a fact from my own experience; for I never keep my horſes confined in a ſtable, winter or ſummer, and find great benefit from this practice; for my horſes ſeldom ail any thing, are not ſubject to coughs and colds, and laſt me more years than my neighbours.

I have two fields of ten acres each near my houſe, and I have a ſtable built ſo as to afford a ready entrance into each field.

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* We agree with our correſpondent in this point, and think horſes ſhould have more liberty allowed where it is in any ſort convenient: in large cities this cannot be done; they may however be now and then ſupplied with green fodder, which would be of great ſervice.

In theſe cloſes I let my horſes range alternately, in each a year at a time; and I have always one of the fields either in wheat or barley, with both which crops I ſow a ſmall ſprinkling of clover; and in this manner they pay me very well.

I do not depend much on the pickings my horſes get of the clover; though it is of ſome ſervice to them; for they are always regularly fed, winter and ſummer, in the ſtable, where I have, for that purpoſe, a rack and a manger properly fixed.

Their general food is, in ſummer, green fodder mowed freſh and freſh, and laid for them in the rack; and this conſiſts of either clover, ſaintfoin, or good meadow graſs: they have beſides a proper allowance of corn, which is always proportioned to the work they do, and the condition they are in; and I do not confine them to oats alone, but allow a variety of beans, peas, tares, oats, barley, and even ſmall wheat, and ſometimes rye. I find by this management they eat their meat heartier, and with a better appetite, and their health is much better preſerved *.

In winter I allow them a moderate quantity of good ſweet hay; but the greateſt part of the corn they eat in this ſeaſon is given them unthreſhed, which is an excellent method: it ſaves hay, as they neceſſarily eat a great deal of the ſtraw or haulm with it, and their appetites are thereby conſtantly kept up, and they do their work with chearfulneſs: beſides, this way of feeding prevents your plowman from giving them more corn than they ought to have, and from ſtarving three or four horſes to make one uncommonly fat, which he happens to take a particular liking to.

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* We have known many gentlemen practiſe this method of permitting their horſes to range at liberty over a few acres: it is certainly conducive to their health; on which account we recommend it. Our correſpondent's other remarks on the management of this generous animal ſeem very worthy of notice.

The ſtalls in my ſtable are conſtantly kept well littered, that the horſes may lie down, either by night or by day, at their eaſe; and they generally prefer lying in theſe ſtalls to ſleeping in the open air; in ſummer, becauſe the flies are there leſs troubleſome; in winter, becauſe they find it warmer, and are not ſo much expoſed to the inclemency of the weather.

By the practice of this method with my horſes, none of them are ever troubled with greaſy heels, which chiefly proceed from their ſtanding too long in the ſame poſture without exerciſe. In the ordinary way of managing horſes, they are always either hard at work, or ſtanding ſtill: this muſt of courſe be unwholeſome, and a mean is neceſſary betwixt the two extremes. A moderate exerciſe is always wholeſome to animals; and if you give a horſe the liberty of ranging at will over a few acres of land, nature will prompt him to be as much in motion as is neceſſary for his health.

Many have aſſerted that the haulm of peas and tares are unwholeſome food for horſes; but I never found them ſo. I know however that they are not good, in too large quantities, for horſes that are kept confined in a ſtable; but let them have the uſe of their limbs, and this fodder will do them no injury.

I imagined, that, in ſuch a work as yours, a hint or two for the benefit of ſo noble an animal as the Horſe could not but be proper: this induced me to write, and this will, I hope, induce you to give a place for my letter in your collection: it is but ſhort, and that may probably be a part of its merit; tho' too much cannot be well ſaid on a good ſubject, eſpecially if it is properly ſaid. How far I have been guilty of impropriety, yourſelves muſt be judges: I have related ſuch facts as I have myſelf experienced, and which will ſtand the teſt of future trials.

ARTI-

ARTICLE VII.

Obſervations upon the management of Cattle, and raiſing Calves.

[From Select Eſſays on Commerce, Agriculture, &c.]

WE do not pretend, in this article, to give a detail of the method of managing cattle: We propoſe only to make ſome remarks upon points, which we have obſerved too commonly neglected. For this purpoſe, we cannot diſpenſe with cenſuring a general fault of all thoſe, whoſe fortunes are under a mediocrity; for people of theſe circumſtances, finding it impracticable to make large profits, reject diſdainfully the ſmall advantages continually in their power; miſtaking the chagrin of envy, and the langour of indolence, for marks of the elevation of their ſpirit, and of the nobleneſs of their ſentiments. In vain, the Wiſe Men informs them, that whoever neglects ſmall profits, will decay day by day: in vain reaſon dictates, that from a ſmall ſtock they muſt be contented with ſmall gain; but that a great number of ſmall profits, which it is eaſy to multiply by labour, become in a ſhort time an object of conſideration. Although experience confirms theſe truths daily, by the decay or proſperity of ſome one of their neighbours, they ſhut their eyes to the true cauſes of theſe events, and impute them to thoſe that are ſuggeſted by malice and indolence.

From the care of cattle reſult the moſt ſpeedy, the moſt abundant, and moſt lawful advantages. There are but too many avaricious monopoliſts in the country, who, hoarding up the corn they cannot uſe, with a view to profit by ſome future bad crop, pave the way for a general ſcarcity, which, whenever it afflicts the nation, they endeavour to prolong. But this wickedneſs cannot be practiſed with cattle. Whoever ſhould perſiſt in keeping more of them than he can maintain, would expoſe himſelf to inevitable ruin, by ſtarving his cattle, and he would be very ſoon obliged to get rid of them. There can be no objection againſt him, whoſe ſtock is in proportion

portion to his paſture: He contributes towards the publie good, by multiplying the ſpecies, by procuring plentiful crops, with the manure he provides for the ground, and by lowering, as much as lies in his power, the price of the moſt neceſſary commodities, by the aboundance he brings to market.

We muſt not however imagine, that, in order to derive a conſiderable advantage from cattle, it ſuffices to have a great number, and to give them the neceſſary fodder: there are many other circumſtances to be attended to, without which it would be in vain to flatter ourſelves with the expectation of riches. In limiting the ſubject to horned cattle, we ſhall obſerve, that they are often kept in too narrow ſtables, from whence many inconveniencies ariſe. Sometimes being provoked, they fight and wound one another. The moſt varocious ſtarve their neighbours, from whom they carry off all the fodder within their reach; and the injured cows decay inſenſibly, become languid, or give little milk. In the ſummer, the heat incommodes them, a circumſtance which makes them grow lean, and diminiſhes the quantity of their milk. Care then muſt be taken, that they have room in their ſtables, that they be cool in ſummer, and warm in winter. At all ſeaſons let them be dry, for that is a material point. Even in ſummer, humidity is diſagreeable to them, and in winter it chills them. To prevent this double inconvenience, it is proper to pave the ſtables with a gentle deſcent, and to dig a ſewer to collect all the water. By this means the cattle will lye always dry, and the dung will run no riſk of growing ſower. Horned cattle contract a habit, ſometimes, of licking one another; and that hurts them to ſuch a degree, that a butcher who perceives it, will give leſs money for them than for others. They are cured of this trick by rubbing the places they have licked with cow dung, the bitterneſs of which prevents them from re-attempting it.

The deſire of profiting by the milk of the cow, is often the cauſe of the calf's being too early weaned. A month or two more, in fine the time required by nature, would ſtrengthen it

it in its youth; it would grow more ſucceſsfully, and in time, fetch a profit with good intereſt.

But this is ſcarce done any where. No ſooner is it believed that it may ſubſiſt without the mother's milk, than the farmer thinks he gains a great deal by weaning it; ill-fed, and infirm, it grows at beſt to be a ſorry bull, or feeble bullock, from which little profit can be derived, and much leſs ſervice.

The principal ſource of this abuſe ariſes from ignorance, and want of reflection. People either do not know, or do not reflect, that the vital fire incloſed in the heart of a new-born animal muſt be augmented; that it attracts and is nouriſhed by that contained in the milk; that this vital fire, weak at firſt, would ſcarce have power to ſeparate the auxiliary fire from the milky particles with which it is incorporated, if milk was a leſs delicate ſubſtance than nature hath formed it for this firſt ſervice; but in proportion as the vital fire acquires force, the milk grows thick, becauſe its groſſer particles are deſtined for forming and conſolidating the body of the animal.

When the vital fire is arrived at ſuch a degree, as to be ſuperior to the ſuccours which the milk can afford, nature excites the animal to ſeek a more ſolid nouriſhment, and then, but not till then, is the time of weaning it. For by anticipating that time, they run the riſk of leaving the animal imperfect in its interior parts; the aliment which is adminiſtred being above its ſtrength, it cannot perform a perfect digeſtion, and the nouriſhment it receives is ſo much the leſs, as in all natural bodies, the ſtrongeſt juices, and moſt efficacious qualities, are always comprehended; and, as it were, impriſoned in the hardeſt particles. Hence it happens, that a ſickly animal does not derive from the ſame food, ſo much nouriſhment as an animal in health. In effect, the vital heat, too much employed in reſiſting the attacks of the corrupted humours, hath not force enough to extract from the aliment, the neceſſary auxiliary fire, which is concealed in its boſom. Beſides, the food being but ill diſſolved, paſſes to excrement, producing only a meagre inefficacious dung.

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As therefore, we may be aſſured, by weaning a calf too early, that it will remain infirm, and of ſmall value; in like manner by leaving it with the mother, as long as its conſtitution requires, we may expect it will become ſtrong and vigorous, and by following this method, we can hardly fail of raiſing a breed of cattle, that will redound both to the honour and profit of the farmer.

Young calves are apt to be attacked by inſects, which diſturb and torment them, while at the ſame time, they prevent their fattening. In order to preſerve them from theſe inſects, and even cure them when they are hurt, it will be proper to prepare an ointment of melted hogs-greaſe and mercury, which muſt be kneaded till they are well mixed together. Spread this ointment upon a linen cloth, then wrap it up in three folds, ſtitch it for a collar to the calves, and it will not only cure them, but likewiſe diſperſe the inſects.

There is no better nouriſhment for the young animals than vetches ſoked in water, till they ſwell; but obſerve to ſteep no more than will ſerve them for once, becauſe when they remain a long time in moiſture, they are apt to grow ſour, and ſo would do them more harm than good.

We ſhall not inſiſt upon the advantages attending the breeding of young cattle, whatever trouble it may coſt; becauſe there is no prudent countryman, who is not fully perſuaded of them. To buy what he may have of his own growth, is to a farmer no acquiſition but a diſſipation; becauſe the land produces no money, which is only to be obtained with the commodities, and very often the purchaſe of ſome goods deſtroys all the profit reſulting from the ſale of others. It ought, therefore, to be an inviolable maxim, eſpecially with thoſe of narrow circumſtances, to ſpare no pains in improving their ſtock, making ſmall eſtimation of what has coſt them no money, but frugal as if they had bought it. By this means, if we except great accidents, which can never be foreſeen nor prevented, they will find wealth flow upon them annually, though ſlowly, and lay the foundations of a ſolid fortune.

ARTI-

ARTICLE VIII.

Thetches, or Vetches, particularly recommended to the attention of Farmers, as affording excellent Green Fodder for Cattle: and being, when plowed in, a good Manure for a ſucceeding crop of Wheat.

[From the MUSÆUM RUSTICUM, Vol. III.]

THETCHES are a grain often overlooked by the farmer; yet are they, when properly cultivated, and applied to proper uſes, highly valuable and very beneficial.

They are a very hardy grain, and reſiſt the ſeverity of a ſevere winter better than moſt other crops; beſides which, they have the additional advantage of growing in almoſt any ſoil; but then the farmer is to expect a produce in proportion to the goodneſs of his land.

I would by all means adviſe, where it is intended for early ſeed, or to ſtand for ſeed, that the ſmall winter thetch be cultivated in preference to every other ſort, becauſe it is not only hardier, but alſo, being ſown about Michaelmas, it is forwarder, to ſerve as fodder, or will be earlier ready to mow for ſeed, which is no inconſiderable advantage: for the thetch being a ſucculent plant, and forming a very thick cover on the land where it is a full crop, it will be in danger of rotting inſtead of drying, if it ſhould be cut late, or the harveſt-weather ſhould be very rainy; but if the winter-thetch is ſown early, it will, in general, be fit to mow in July, or the very beginning of Auguſt, when there is leſs danger.

Few farmers allow more than one plowing for thetches: I always allow two, notwithſtanding what the neighbouring farmers tell me of turning the freſh ſoil again down to the bottom of the furrow: I find my advantage in this practice, and ſhall therefore continue it.

I have generally experienced the firſt week in October, if the weather is fine, to be the very beſt time for ſowing

thetches; and I allow only two buſhels of good ſeed to every acre, which I find full ſufficient.

I ſow them broad-caſt on the rough land, as the plow leaves it after the ſecond plowing, taking care to harrow the field length-ways and croſs-ways, in order to cover the ſeed the better; after which I paſs over it a roller, heavier or lighter, according to the nature of the ſoil and the dryneſs of the weather, obſerving, that if the weather is dry, and the ſoil light, I uſe a heavy roller, in order to cloſe the pores of the light earth; but if the ſoil is ſtiff, and the weather damp, I uſe a lighter roller, leſt I ſhould knead and cruſt the field over, ſo as to ſtop the young ſhoot of the vetch.

This crop will, in general, choke all the weeds that come up with it; but this muſt, however, be underſtood of the ſmaller ſorts, for if there are many large rampant weeds, it will be neceſſary to have them extirpated with the hook.

Thetches afford excellent food for ſheep in the ſpring, make cows give a great deal of good milk, and horſes are fonder of them cut green than almoſt any other food.

The beſt way is to cut them freſh and freſh every morning as they are wanted; and if the farmer has occaſion for them for this uſe only, he may ſow in the ſpring, to great advantage, the large thetch, at different times; by which means he will have a ſucceſſion of crops, which, to give green to his cattle, he ſhould always cut juſt before the plant flowers, for it is then in its tendereſt and moſt ſucculent ſtate, and will afford moſt nouriſhment; whereas, if he leaves it till the ſeeds are nearly ripe, the ſtalks harden, grow ſticky, and are of far leſs value; beſides, that many of the lower leaves will, by this time, be withered, or dropped off, and intirely loſt.

I muſt not conclude this letter without mentioning an important uſe to which thetches are often applied; I mean, a full crop of them is frequently plowed into the land as manure, to prepare it for a ſucceeding crop of wheat.

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When thetches are ſown with this intention, I would recommend the large ſort, and that four buſhels of good ſeed ſhould be uſed, to be ſown broad-caſt twice in a place: But my way of ſowing it is ſomewhat peculiar when I mean to plow it in; therefore I think it may not be amiſs to relate it to your readers.

Moſt farmers ſow it by caſting it twice in a place; immediately after the land is plowed, and then harrow and roll the field; but I proceed as follows.

As ſoon as the field is plowed, I ſow two buſhels, broad-caſt, on every acre; after which I harrow it length-ways and croſs-ways. When this is done, I ſow the remaining two buſhels, and then harrow it twice again with a pair of heavier harrows, and finally, ſcratch it twice over with light harrows to raiſe a mould, concluding my work by paſſing a roller over the whole field. By this management I ſcarcely ever miſs of a full crop, which covers the whole land, chokes the weeds, and ſerves as excellent manure for the wheat that is to follow.

I have always found, that this huſbandry ſucceeded beſt in light, hungry, ſandy, or gravelly loams; and a brother of mine, who lives in Bedforſhire, tells me it does very well on a chalky ſoil, provided there is any heart in it.

The time I chuſe to plow in the thetches is juſt after the bloſſom fades, and the kid begins to form: and it is really ſurpriſing to ſee what a ſtrong fermentation they raiſe in the ſoil.

I have ſometimes had my crops ſo heavy, that I have been obliged to mow, or hook up, the thetches before I could plow the land: but this is not often the caſe; when it is, the farmer has reaſon to rejoice.

There are, as I hinted in the beginning of this letter, ſcarcely any ſoils but the thetch will thrive in, though ever ſo various in their nature. I am an old man, gentlemen, and, in the courſe of many years experience, have ſown thetches often

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on a ſandy and gravelly loam, a chalk, though not for plowing in, a gravel, a low damp clay, and a perfect brown loam. On all theſe varieties of ſoil have they ſucceeded with me; but I muſt note, that the farmer may expect a larger crop from a gravel (I do not mean a pure gravel) that has ſome heart and ſtrength in it, than from the fineſt loam, which has been, by a long continued courſe of bad culture, ſtarved and impoveriſhed.

The large thetch may be ſown in January, February, March, April, or even the beginning of May, when deſigned for green fodder: but I would, by all means, have the induſtrious farmer avoid ſowing it before Chriſtmas, for it is a tender plant, and if hard froſts enſue, he may chance to loſe his crop.

I fear I have taken up too much ſpace by the length of this letter; but I hope you will excuſe it. I am a great advocate for the new huſbandry; yet am I one of thoſe who think it beſt to recommend to farmers the amendment of their old practices, before we ſhould attempt to introduce among them new doctrines which they do not underſtand, and which they will, for ſome time to come, object to, merely becauſe they are new.

A further account of the advantages to be derived from the Vetches; and the method of making them into Hay.

IT would certainly be of great national advantage, could our ſtock of cattle and ſheep be increaſed, without diminiſhing the quantity of our lands that are in tillage.

This can no otherways be done, but by encouraging the growth of artificial paſtures, which the farmers have of late years fallen into.

The turnip-huſbandry is not of very old ſtanding in this iſland, yet has it made a very rapid progreſs. The immenſe utility of it, when properly practiſed, cannot but be evident, even

even to an ignorant common farmer, on the ſlighteſt inſpection. This evident utility of it has occaſioned its being almoſt univerſally practiſed in the counties of Norfolk, Suffolk, and Eſſex, whence it has ſpread to other parts of England, and is of late even adopted in Ireland, where, I am informed, the gentry are very intent on improving their eſtates.

The coleſeed plant has alſo its utility; and in many places is as univerſally ſown as the turnip. I have myſelf very often raiſed this crop, as well for feeding ſheep, &c. as for the ſake of its ſeed, and have had no little ſucceſs in this huſbandry, being very fond of it, as coleſeed is an excellent crop to overpower, choke, and deſtroy weeds.

Many farmers, who hold land of a fenny or moory nature, will, I hope, be encouraged to attempt this huſbandry to their great emolument; a huſbandry to which they were before utter ſtrangers; for though they might know the upland practices, this could be but of little uſe to them.

So much in general; but the particular reaſon of my now writing to you, was to recommend to the induſtrious farmer the cultivation of vetches as food for cattle.

I have often ſown this crop with great ſucceſs, to prepare my land for wheat, and have always found, that by growing to a large cover they deſtroy and choke up a great number of weeds, which would otherwiſe do me immenſe damage; indeed I think them, for this purpoſe, next in rank to a hoeing crop.

When I ſow vetches before wheat, I always, in the ſpending my crop, have regard ro the condition of my land.* If my land is not in good heart, but wants mending, I not unfrequently fold my ſheep on it, and feed off my crop in the field; but if it is inclined to be rank, or the wheat, which is ſowed on it, is apt to run much to ſtraw, I often cut my vetch-

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* Laſt year I cut my winter-vetches, and fed my horſes with them green, and had them off before the middle of June; after which the land was prepared and drilled with turnip, which were a good crop.

es green, and feed my horſes in the ſtable with them. I find no food agree better with them; they thrive well, grow fat, and are always in good health and ſpirits when thus fed.

I ſometimes alſo mow my vetches when they are in bloom, and make them into hay, in the ſame manner I manage my clover and meadow graſs; all which I leave in graſs cocks in the field, whilſt it is haying, very ſeldom ſpreading it, for fear of rain; and after two or three turns it is generally fit to carry.

The great art in making hay of vetches, is to contrive in ſuch ſort, that the leaves do not drop off the plants, which, if left too long, or dried too ſuddenly, they are apt to do; and the farmer is to underſtand, that great part of the peculiarly nouriſhing quality of the hay reſides in the leaf.

I ſay peculiarly nouriſhing; becauſe almoſt every kind of cattle, as horſes, oxen, cows, and ſheep, are fond of it, and they all thrive on this food amazingly: this I have often experienced, and moreover obſerved, that they make no waſte even of the ſtalks, which they eat with an appetite.

In this manner I manage for my hay, when I am inclined to have it very fine and fit for my cows and ſheep; and in this manner it is no very difficult matter to get it in good order, ſweet and wholeſome; but when I intend it only for my horſes, I generally let my crop ſtand ſomething longer; that is, till the kid, or pod, is formed, and the ſeed about half grown within it.

When the hay is made in this laſt way, the buſineſs is much more tickliſh, and conſtant obſervations muſt be made to ſee when the crop is in proper order to cut; becauſe, if it is left too long, the ſtalks grow hard and ſticky, and the leaves are apt to drop off.

This hay is more nouriſhing, when cut in this laſt method, than I can well deſcribe: it anſwers both for hay and corn; and with this food my horſes will be in good fleſh, health, and ſpirit, and be able to do a great deal of work. I have often proved this to be true, can therefore the better venture to aſſert it.

I have ſtill another method of making theſe vetches into hay, which is to leave the crop, till the ſeed is grown to its full ſize in the pod, though not ripe: I then mow them, and, when dry, threſh them on a cloath in the field; by which means I procure a conſiderable quantity of pigeons meat, which fetches me a tolerable good price; and this pidgeons meat ſells better at market, than if the vetches had ſtood till the ſeed was thoroughly ripe; for by cutting the crop when the ſeeds are barely full grown before they begin to harden, they ſhrink in the drying, and thereby become of a ſmaller ſize than they are by nature, and conſequently more proper food for pidgeons than if they were larger.

I own, the hay in this laſt method is not quite ſo good, as many of the leaves will, in ſpite of all the care that can be taken, drop off, and the ſtalks will be a little ſticky: yet, after all, it ſerves very well for my ordinary cattle, and even for my plow and cart horſes, with the aſſiſtance of a few oats.

Vetches are a very good plant to ſow thick on land, and when they have formed a perfect cover, to plow them in, in order to the land's being ſown afterwards with wheat on one plowing. In this intention they anſwer to the full as well as buck-wheat, or clover.

When a farmer intends to plow in his vetches, I would by all means adviſe him to do it ſome weeks before he ſows his wheat, that they may have time to ferment and rot, or the conſequences may be fatal to his crop: I once myſelf loſt the chief part of a fine field of wheat by this overſight.

I ſhould be glad to ſee ſome of your very ingenious correſpondents enlarge more than they have yet done on the ſubject of manures, the nature of the ſeveral kinds being very little underſtood by common farmers; yet is there nothing more dangerous than a miſapplication of them; and to this miſapplication of manures may we, in a great meaſure, aſcribe the preſent ſlovenly method of huſbandry practiſed in moſt counties, the failure of crops, and the abundant increaſe of noxious weeds.

ARTI-

ARTICLE IX.

Of the Improvement of Wet Paſtures

[YOUNG's Farmers Letters, Vol. I.]

AS I have, within a few years, not only had ſome experience in my own farm, but obſerved the methods employed by many neighbouring gentlemen and farmers in mending their paſtures. I ſhall communicate a few of my remarks on the improvement of wet paſtures; a ſubject which may prove, perhaps, of ſome little utility, as I ſhall ſpeak of nothing but what I have either performed myſelf, or ſeen in my neighbourhood.

The particular lands of which I ſpeak are looſe, woodcock, brick-earth ſoils for about eighteen or twenty inches, and under that, clay to a great depth.

Some that I have improved myſelf are exactly level, ſo as to be quite poiſoned with the wet, which could not drain off.

From the beſt obſervations I could make on many experiments, the following is the method which anſwers beſt to improve them. I ſhall alſo inſert the expence.

The firſt thing to be done is, to make large deep ditches round every field, and if they are large, to divide them into ſmaller ones, of five, ſix, or ſeven acres each, by new ditches: nothing is attended with a more ſudden improvement of all the ground near the borders of the fields, than good ditches.

I generally make mine ſix feet perpendicular deep, ſeven wide at top, and three at the bottom. I never pay for them by the rod, (which is cuſtomary) but give two-pence halfpenny per load, of thirty buſhels, for all the clay, &c. that is thrown out of them, and two ſhillings and ſixpence a ſcore loads for filling and ſpreading it.

Theſe ditches ſhould be made in ſuch a manner, that no water can remain in them, but a deſcent from one to another to carry it quickly off.

It

It may be eaſily imagined how much theſe muſt drain the land, beſides the quantity of excellent manure (clay) which ariſes out of them. Add to this, the great convenience of having ſuch fences about a farm, that the farmer is ſure to find his cattle wherever he turns them, inſtead of their breaking perpetually into his corn or hay-fields, which, in multitudes of farms, is ſo often the caſe: it is ſometimes the work of a boy, only to be hunting after hogs and ſheep that go aſtray for want of good fences.

In the banks of new ditches we always lay white thorn, fifty roots to a rod (the workmen are allowed ſixpence per hundred for gathering them;) but I always avoid intermixing any thing with it, eſpecially heſal, for in the nut-ſeaſon fences are pulled in pieces for the fruit by all the boys and girls in the neighbourhood; and oak, aſh, &c. only to give an opportunity to get over the hedge with great eaſe. Sallow, willow, elder, &c. are to be avoided in the hedge, or by way of hedge-ſtake for the dead hedge, as they grow ſo faſt as quite to overſhadow the quick-ſet, and even deſtroy it. After frequent cuttings, to render the plants thick and ſtrong, I keep the quick-ſets regularly clipped, which, in a few years, render the fence impenetrable to man or beaſt, conſidering the largeneſs of the ditch.

If an old fence is grown bad or thin, or compoſed of improper plants, I never yet obſerved it improved by planting quick-ſets in the gaps: the beſt way is, to reverſe the bank, and plant freſh white-thorn.

When the ditching is done, the next work is to land-drain the whole fields in ſuch a manner, that every part of them may be laid dry. In a paſture of ſix acres I did two hundred rods. If there is the leaſt fall in any part, or any place more wet than others, the drains ſhould be cut through them. If the ſurface is exactly level, the depth of the drains ſhould vary, ſo that the water may every where have a deſcent.

Theſe drains are made here, in general, thirty-two inches

deep, twenty inches wide at top, and four wide at the bottom. They are filled eight inches deep with either ſtones or wood; but I ſhould ever recommend the former, as the moſt effectual and laſting, to thoſe who are not deſirous of ſaving the difference of the expence [Vol. I. p. 158.]. However, I know many fields in this pariſh and neighbourhood, that are drained with wood, and which anſwer extremely well; and I have been aſſured that they will laſt twenty or thirty years †. Nay, in ſome parts of Eſſex I hear they do it with ſtraw alone; but this muſt be of ſervice for only a few years, unleſs the ſoil, when the ſtraw rots, forms an arch: if ſtone be uſed, there can be no doubt of its laſting. The labour of the whole is three-pence per rod.

If with ſtone of the farmer's, a load of thirty buſhels will do three rods, and coſts one ſhilling and a half penny ſtubbing and picking; ſo the expence of a rod is ſeven-pence, beſides carriage of the ſtone, which will not be much: but if he buys his ſtone, as is much the moſt probable in this country, we may ſuppoſe he muſt go two miles to fetch it, and give twenty-pence for thirty buſhels ready picked: the carriage is worth as much more, thus the ſtone, in this way, will coſt per rod better than thirteen-pence.

If buſhes are uſed, a load of forty faggots will coſt the farmer, if he buys them, or be worth, if he has them, five ſhillings, and coſt cutting one ſhilling ‡. They will do ten rods; ſo that the whole expence of doing a rod with them will be ten-pence, and with ſtone one ſhilling and four-pence.

The very firſt year the prodigious advantage of theſe drains appears, eſpecially if the ſeaſon proves wet. The graſs (or corn if in ploughed fields, for they anſwer in all) will be freſh, vigorous, and ſweet, wherever the paſtures are drained.

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† I have met with ſome in perfect order, 40 years old; and likewiſe many that run as well as ſtone ones.

‡ Good buſhes proper for ſtrong fences cannot be had under 7s. per load.

I have a field of ſix acres (mentioned above) which, by land-draining, ditching, and manuring, is an exceeding good paſture, and has produced two tuns, and ten hundred weight of hay per acre, in a very good year, and generally thirty-five hundred weight per acre; whereas the paſtures adjoining are ſcarce worth the farming, and let but at ſeven ſhillings per acre, producing ſcarce any thing but a little feed for lean cattle. The ſoil is the ſame in both; the ſix acres, about twelve years ago, being full as bad as the reſt.

To improve ſuch wet land, nothing can be more advantageous than the clay which is thrown out of the ditches. Eighty loads per acre is the quantity I have laid on, and have been told by ſeveral ſenſible farmers (who clay a good deal) that it is a proper covering; but if nothing is mixed with it, ninety-five or one hundred. I know a piece of graſs land greatly improved, on which were ſpread one hundred and fifty loads per acre.

My method is to make a large hill of manure, by firſt laying a quantity of clay regularly on a heap; then placing a thin layer of muck, ſuch as I have, upon it, either my ſtable or rack-yard dung, or bringing it of any kind in my waggon from the neareſt town; on this layer, another thick one of clay; then the ſecond of dung, and ſo on; letting the proportion be about twenty loads of dung to fifty of clay. Theſe heaps, after remaining ſix months without ſtirring, I mix well together by turning them over, which a workman will do, at the rate of eight ſhillings for one hundred loads. Let it lie ſix months longer in this ſtate, and then carry it on to the land, paying two ſhillings and ſix-pence per ſcore loads for filling and ſpreading. This I take, from experience, to be by much the beſt way of manuring with clay, as it works and impregnates the ſoil much ſooner than alone.

Whenever I clay arable land, I do it on clover-paſtures, after the crop of corn is off, managing it in the ſame manner as for paſtures. If it is plowed in directly, it is ſeveral years before it works; but having a winter and ſummer to diſſolve and powder it, it

waſhes

waſhes into the ſoil more equally, and much enriched by the effects of the air, acquired by being ſo long expoſed.

Theſe are the principal points to be obſerved in improving ſuch wet, cold, looſe paſtures as I have deſcribed: ſome that I have quite changed by theſe means were half over-run with moſs and ruſhes; but draining them thoroughly, and claying them, kills all trumpery of this ſort, and preſents the farmer with ſo admirable a view of good paſture for dairy or grazing, where ſo lately nothing could live, as to be equalled in ſcarce any thing of the kind.

But as all improvement ceaſes to be ſuch, when more money is ſpent in it than the advantages will repay, I ſhall, in a few words, ſet forth how far this is from being the caſe here. I will ſuppoſe two or three fields are improved, amounting in the whole to twenty acres.

	l	*s.*	*d.*
Sixty loads of clay per acre thrown out of the ditches, twelve hundred loads, at two-pence half-penny per load, - - - - - -	12	0	0
I will ſuppoſe ſixty rod of new ditching done, which, before clay is thrown out by the load, will coſt one ſhilling per rod, - - - - -	3	0	0
Three thouſand quick ſets, at ſix-pence per hundred,	0	15	0
Land-draining ſeven hundred rod with buſhes (this is the quantity I have now marked out in a field of twenty acres) at ten-pence per rod,	29	3	4
N. B. I had a great part of a crop of barley killed in a field of this ſize with the wet: I had therefore a fine opportunity of marking exactly where the drains ſhould be made, which ought, on ſuch occaſions, never to be omitted, were it only for the common water furrows which are made for every crop. In ſome fields, unleſs ſuch a guide offers, it is very difficult to tell exactly where to make the land drains.			
Turning and mixing one thouſand ſix hundred loads of manure, - - - - -	6	8	0
Filling and ſpreading one thouſand ſix hundred loads, at two ſhillings and ſix-pence per ſcore, -	10	0	0
Carry over	61	6	4

	l.	*s.*	*d.*
Brought over	61	6	4
I will ſuppoſe that the work may be done the ſooner, if the farmer brings one hundred loads of the four hundred of dung from the neareſt town; and as I have not reckoned the horſes and driver for the clay cart, I ſhall not in the bringing the dung: therefore the expences per waggon-load will be, the coſt three ſhillings, boy ſix-pence, and turnpike ſix-pence. A waggon-load is two tumbrel-loads (in this country) ſo fifty loads, at four ſhillings, are - - -	10	0	0
Total	71	6	4

This is three pounds eleven ſhillings and three-pence per acre: and, ſuppoſing the profit to laſt but twenty years, although the draining and ditching part will laſt twice that time, and the clay five and twenty as good as at firſt. But the farmers thereabouts ſeldom change their farms, if tolerable ones, living in them their lives, and their ſons after them, with leaſes of ſeventeen, twenty-one, and twenty-five years: ſuppoſing twenty years profit, I ſay, the expences will then be, *per* acre *per annum*, three ſhillings and ſix-pence halfpenny.

So ſmall is the expence divided. But now let us conſider the profit.

Such land as I have deſcribed never lets here for more than ten ſhillings per acre, by far oftener for eight ſhillings, or eight and ſix-pence: and it is from my own experience, as well as various obſervations, that I aſſert the ſame land, after the improvements, will let to any tenant for ſeventeen, eighteen, and twenty ſhillings per acre.

I will ſuppoſe it only ſixteen ſhillings, though I am certain that it is conſiderably under the mark: he then gains, in point of rent, ſix ſhillings per acre; and the whole calculation is abſurd, if we do not add this whole proportional profit on the acre: ſuppoſing his profit on it before improvement was a rent, ten ſhillings; afterwards it will undoubted-

ly

ly be the ſame, at leaſt; which adds ſix ſhillings more to the profit; ſo that the whole will be twelve ſhillings per acre per annum.

	L.
Twelve ſhillings per acre is per annum, for twenty years,	240
Expences of improvement, - - - -	71
Clear profit, - - - - - -	169

	l.	s.	d.
That is per annum, - - - -	8	9	0
Deduct the intereſt of ſeventy-one pounds, -	3	11	0
Clear profit per annum, - - -	4	18	0

I think the caſe of this improvement is ſtated clearly; and muſt repeat, that I ſpeak from experience. The ſum to be expended on twenty acres will appear large to moſt farmers, whoſe property is not conſiderable; but the proportion holds for a ſingle acre, and thoſe who cannot afford to improve twenty, may three, four, or five; and I make no doubt but in ſuch an attempt they will find their account in it greater than I have ſtated it.

As I have mentioned a tumbrel-load to be thirty buſhels, and a waggon load to be but two tumbrels, I ſhould obſerve that we carry away of muck fifty buſhels at a time in our tumbrels, and ſo agree with our men in proportion to the thirty buſhel loads.

I have obſerved, that in making new ditches, or enlarging old ones, I ſeldom pay by the rod, but by the load: however to thoſe who chuſe the former way, I would recommend that they have them worked by a frame of ſmall ſlit deal, nailed into the exact ſize of the intended ditch, and agree with the workmen to do their work by it: this will prevent diſputes which frequently ariſe.

ART

ARTICLE X.

Of the culture of Furz or Whins for Winter Fodder, and of its great benefit as Food for Horſes.

[From the MUSÆUM RUSTICUM, Vol. I.]

THE great aim of the preſent farmers ſeems to be the procuring plenty of winter fodder at a cheap rate. To anſwer this intention, they ſhould ſome of them practiſe a method much in uſe in the Principality of Wales.

As we do not in many diſtricts there ſow any great quantity of corn, ſtraw for fodder is a ſcarce commodity: beſides our lands being poor, what ſtraw there is, muſt of courſe be ſhort.

To remedy this evil we ſow furz, otherwiſe called gorſe or whins: this we cut at three years growth, and after paſſing it through a machine which cuts and bruiſes it at the ſame time, we give it to our horſes, which feed on it, and thrive to admiration.

I have had much experience of the benefit of this food; it is healthful, ſtrengthening, and gives them ſpirits; they are fond of it, and eat it without inconvenience, the ſpines which would prick their mouths being broke by the machine. I have kept nine or ten horſes for ſome years paſt, in winter time, chiefly on this food.

We cultivate it in manner following. Almoſt any ſoil will do for it, but it ſhould not be too wet.—After plowing the land, it is ſown with a broad caſt: one pound of ſeed is enough for an acre, though ſome ſow more. The farmer ſows a certain number of acres, in proportion to the number of cattle he has to feed.

The ſecond and third years he ſows the ſame quantity of land with the ſame crop.

The third year, as I mentioned above, the furz is fit to cut from the firſt ſowing, and the others in due courſe follow.

Some

Some poor husbandmen, who sow but little, send every morning, during the winter season, two men into the furz-field with a scythe, and a large basket slung on a pole; these mow it, tread it into the basket, and bringing it home, they prepare, with the machine above mentioned, the day's allowance of food for the beasts; the basket, in general, holds enough to serve for the days.

This practice of sowing furz might certainly be followed with profit in many parts of Egland: I know, myself, several places where there are large tracts of poor land fit for this purpose, and winter fodder is exceeding scarce; but the misfortune is, this method is not generally known, and wants the sanction of authority to recommend it.

Having a horse which had been over-worked, to the appearance of a surfeit, I treated him in the usual manner for that disorder; and knowing how necessary it would be to his speedier recovery to give him green food after his physic, it occurred to me that furz might answer the purpose immediately, as there could be none of the common herbage procured before the end of April at soonest: I therefore had a quantity of the tops and tendereſt parts of that plant cut daily to preserve it fresh, which I hashed upon a block, with a very long and heavy chopping knife, as small as possible, and then beat it again over the same block with a carpenter's mallet, (which blunted in a great measure the sharp prickles), and gave half a peck a day of it to the horse (in the stable), which eat it most greedily, and received so much benefit from it, that he is totally recovered, and carries a very fine coat.

The success of this experiment led me to consider the great utility this plant may be of to poor people, who live in the neighbourhood of large commons over-grown with it, as food for cows in winter, when fodder is dear, and in reality not so proper for milk cattle as this green food, which must naturally increase their milk, and from the fragrant smell it sent forth while cutting, it may reasonably be conjectured, will give no ill taste to it, as many vegetables do.

THE SCOTS FARMER,

DECEMBER 1773.

ARTICLE XI.

Of the choice of Seed, and of Sowing—Of the culture of Wheat.

[Dickſon's Agriculture, Vol. II.]

MR Dickſon having premiſed ſome general things to be attended to in the management of a farm, [ſee N° I. p. 1.] before he proceeds to give directions for the culture of particular grains and plants, takes under conſideration two articles, which have always been conſidered as of great importance in farming,] the choice of ſeed and the manner of ſowing it.

Of the choice of Seed.

The generality of farmers are careful to chooſe the beſt of their grain for ſeed. Where the rents are paid in victual, the farmer has this in his power; and the landlord muſt content himſelf with what is inferior in quality. This is certainly a very good cuſtom; for upon ſome ſoils, the ſeed that is ſown degenerates.

But this aſſertion, that ſeeds degenerate, muſt be confined to the ſeeds of ſuch plants as are not natural to the ſoil and climate; for if it required ſuch pains to prevent every kind of corn from degenerating in every ſoil and climate, the corn in ſome countries would have been by this time reduced almoſt to nothing. It is probable that the corn, that is not natural to

the ſoil and climate where it is ſown, degenerates, till it arrives at a ſituation in which it becomes natural to theſe, and that then the ordinary culture given is ſufficient to preſerve it from any further degeneracy. Almoſt all the corn which we cultivate in our fields is of this kind, and therefore the greater care that is taken in the culture and the choice of ſeed, it will be preſerved in a ſtate the more perfect. This care may not only preſerve ſome of the corn, which is not natural to our climate and ſoil, from degenerating, but may alſo be a means of improving that which is natural to it. But though corn degenerates, yet it does not arrive, by once ſowing, at that ſtate of degeneracy that renders it natural to the ſoil. It may be ſown many years before that happens, though every year it may be drawing by degrees nearer to it; this makes it neceſſary for the farmers, in whoſe land the corn degenerates much, to bring their ſeed from ſoils and climates to which the kind of corn they ſow is more natural, and even for the farmers who poſſeſs theſe better ſoils and climates, to be very careful in chooſing the beſt of their grain for ſeed.

It is a general opinion among farmers, that the changing of ſeed is attended with advantages, though there ſhould be no difference with reſpect to the quality. It may be obſerved, that different ſoils are infeſted with different kinds of weeds, according to their natures; and that the weeds that infeſt one kind of ſoil, are not to be ſeen in another. As this is the caſe, the ſowing ſeed from a different ſoil is attended with this advantage, that no dangerous weeds are ſown with the ſeed. It is very difficult to free corn altogether from the ſeeds of the weeds that grow amongſt it: When corn therefore is ſown upon the ſame kind of ſoil from which it has been reaped, the weeds ſown along with it being adapted to the ſoil, naturally prove hurtful; but, when ſeed is ſown from a different ſoil, though there may be weeds amongſt it, and theſe weeds may ſpring up, yet, receiving no encouragement from the nature of the ſoil, are ſoon deſtroyed.

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It is uncertain, whether there is any other advantage arising from a change of ſeed of equal quality. If there is, it muſt be of that kind of grain that is adapted to a variety of ſoils and climates; and the advantage muſt ariſe from ſome particular quality that the ſeed acquires by being often ſown upon the ſame kind of ſoil: but this falls more naturally to be enquired into, when treating of the culture of particular plants.

Of Sowing.

There are two different ways of ſowing. In the ordinary way of ſowing, the ſeed is ſcattered by the hand; and men, by practice, become tolerably exact in doing it. The other way is by a machine called a *Drill*, made on purpoſe. This machine is more troubleſome in ſowing, and leſs expeditious than the common way of ſowing by the hand; and, like all complex machines, is apt to go out of order, and put a ſtop to the work: but then the ſowing by it is attended with advantages that do far more than overbalance theſe. This machine is conſtructed in ſuch a manner, as to diſtribute the ſeed with the greateſt exactneſs, ſo that the preciſe quantity propoſed may be ſown upon any field, and, at the ſame time, the ſeed equally diſtributed over all. But there is ſtill a greater advantage that attends ſowing by the drill; the regularity with which the ſeed is ſown, allows the corn to be cleared of weeds, with little trouble, and at no great expence. The drill ſows the ſeed in rows; this allows the hoe to be uſed for the deſtruction of the weeds, which cannot be done when the ſeed is ſcattered in the ordinary way.

The quantity of ſeed proper to be ſown depends upon a variety of circumſtances; the kind of ſeed, the ſeaſon of ſowing, and the ſituation of the land. Theſe things fall naturally under our conſideration, when the culture of particular plants is treated of. However, it will not be improper in this place to conſider, in the general, whether the ſowing thin or ſowing thick is moſt advantageous. It is not neceſſary to be very

particular

particular in explaining what is meant by thin or thick ſowing. The ſowing leſs than what is commonly done in any part of the country, is thin ſowing; the ſowing more than this, is thick ſowing. The generality of the writers upon this ſubject recommend thin ſowing, and they complain much of the obſtinacy of the farmers, for not following their directions. The farmers are not ſo obſtinate as not to try the different ways of ſowing, nor ſo ignorant as not to know when to ſow the one way, and when the other. They often ſow thinner than they ought to do, as appears from the ſituation of the crop; and perhaps as many farmers may be found that leſſen their crops by ſowing too thin, as there are that hurt them by ſowing too thick. I am perſuaded that the quantity of ſeed commonly uſed is the moſt proper. The farmers in general, whatever they may be in other reſpects, are certainly attentive enough in their management to every thing that ſaves expence. Their greateſt fault, generally ſpeaking, is the one oppoſite to this. They ſcruple to lay out money, though the advantage is obvious; but they are apt enough to enter into the ſaving plan, whenever there is a probability that it will ſucceed. Had the trials of ſowing thin, which have been made, proved very ſucceſsful, we may be certain that the practice, before this time, would have become general.

Previous to the inſiſting with the farmers to uſe a ſmaller quantity of ſeed than they commonly do, they ſhould be directed to clear their land of weeds; for, without this, the uſing leſs ſeed, inſtead of being beneficial, muſt certainly prove a real diſadvantage. Some of our richeſt lands in Scotland are very much infeſted with weeds, and the preparation made for ſowing gives ſuch encouragement to the vegetating of their ſeeds, that the land produces for certain a plentiful crop of ſome one thing or other. If a ſmall quantity of ſeed is ſown, a great many weeds ſpring up along with it; theſe weeds prevent all the advantages of thin ſowing: they prevent the corn from *tillering*, or *ſtooling*, as we call it in Scotland; they keep the

the air from the roots of the corn, and thereby expoſe it to be lodged; and beſides, they come to perfection themſelves, and ſow their ſeeds: Whereas, when the ſeed is thick ſown, the corn ſoon covers the ſurface, and prevents many of the weeds from getting up. It muſt be acknowledged indeed, that, when corn is ſown thick upon rich land, it is in very great danger of being lodged; and it is to prevent this that thin ſowing is ſo much recommended: but then thin ſowing does not prevent this upon land much infeſted with weeds, for the weeds ſhut out the air as effectually as the corn itſelf when thick ſown, and it is the want of free air that makes the corn lodge. When the air has free acceſs, it hardens the ſurface, and, while the ſurface is hard, the corn is in no great danger of being lodged: But, when the air is ſhut out, the ſurface becomes ſoft and looſe, ſo that the roots of the plants are not able to ſupport the weight of the top. When corn is thin ſown upon land where there are no weeds, the air at firſt has free acceſs, and, though the plants ſhould tiller in ſuch a manner, as to form as many ſtalks on the field as when the corn is thicker ſown, yet the ſtalks, ſtanding nearer to each other at the root, the air has eaſier acceſs round the plants. Hence corn ſown thin upon clean land, is not ſo apt to be lodged, as corn that is thick ſown, though there ſhould be an equal crop on the field. But it muſt be obſerved, that, if ſeed is too thin ſown, the corn is as apt to lodge as when it is too thick ſown. When ſeed is ſown very thin, and the land in very good order, the plants have ſo much room to tiller, that the top becomes too heavy for the root, and falls over almoſt of itſelf. Inſtead therefore of inſiſting with the farmers to ſow leſs ſeed than they commonly do, which in ſome caſes may be dangerous, they ſhould rather be directed to make their land as clear of weeds as poſſible, and then thin ſowing, ſo far as is proper, will follow in courſe.

Of

Of the culture of Wheat.

Wheat is the moſt valuable grain that is ſown in our fields. There are not many places in Scotland where it can be ſown with advantage; for it requires not only a rich ſoil, but a warm climate.

There are many different kinds of wheat; The Engliſh authors mention no fewer than thirteen different ſpecies beſides ſeveral varieties in every ſpecies. Whether theſe are really all diſtinct ſpecies, or whether the differences that appear betwixt one kind and another, are occaſioned by the different ſoils and climates where they have been propagated, is uncertain. There is no doubt that the difference of climate, ſoil, and culture, makes a very great change in the appearance of plants. This is well known to every floriſt. However, it is not probable that any change of climate, or ſoil, or culture, could produce ſuch a change, as muſt have been done in turning red wheat into white, or ſmooth-ear'd wheat into bearded. It is obſerved indeed, when a kind of wheat is brought into any part of the country, different from the wheat commonly ſown there, that, after it has been frequently ſown, it degenerates into the common wheat. This has made ſome perſons conclude, that all the difference that appears betwixt one kind and another is occaſioned by the climate, ſoil, or culture. But the degeneracy of a particular kind of wheat, introduced into a part of the country where none of that kind is ſown, may be accounted for, without ſuppoſing that the climate, ſoil, or culture changes it. Without very great care after the firſt ſowing, ſome grains of the common wheat will mix with the other. This may happen by a variety of accidents. The common wheat ſown along with the other, being better adapted to the ſoil and climate, produces a greater encreaſe; and hence every time that this ſeed is ſown, there is a greater proportion of common wheat ſown amongſt it, and, at length,

it

it becomes almoſt all of this kind. By theſe means any kind of foreign wheat, after being frequently ſown, may be changed into the common wheat of the country, though they ſhould be diſtinct ſpecies, and would continue ſo in all climates and ſoils, if kept quite ſeparate. But this is a ſubject rather curious than uſeful, and therefore I ſhall not inſiſt upon it any further.

Notwithſtanding the many kinds of wheat in England, we ſcarcely know more than two in Scotland, the white and the red. The laſt is reckoned the more hardy plant of the two, and does very well in ſome ſoils and climates where the white does not ſucceed.

A kind of bearded wheat is uſed in ſome places. It has a very ſtrong ſtalk, and the grain adheres cloſely to the ear, ſo that it is not ſo apt to lodge as the other wheat, nor the grain ſo liable to be ſhaken out by the wind. Beſides theſe advantages, it is a hardy plant. It ſucceeds very well on wet land, and the grain produces a great deal of flour. Theſe things would no doubt render it more common, was it not that the bakers complain, that it makes bad bread. But it is ſaid, if theſe perſons were better acquainted with it, this objection would be removed; for though it makes bad bread when uſed by itſelf, yet the mixing it with other wheat, in the proportion of one to three, is a real improvement, and makes better bread than any unmixed wheat.

The white wheat which we have in Scotland is not of one kind; but a mixture of almoſt all the kinds uſed in England. This is obvious to every perſon that takes a view of a field of wheat when it is in the ear. There one may obſerve ſome ſtalks very tall, and others ſhort, though equally vigorous, ſome ears ſmooth, and others bearded, ſome ears long with the grain thinly ſet in them, and others ſhort with the grain ſet very cloſe, and the grain itſelf in ſome ears very white, and others of a pale browniſh colour. This, it is probable, is occaſioned by an improper method taken to provide foreign ſeed.

It

It is found from experience, that in Scotland wheat degenerates; for which reaſon a freſh ſupply of ſeed is every year brought from England. This ſupply is often brought from the granaries about London, where there is a mixture of all kinds; and hence the mixture, which we obſerve ſo frequently in our fields here in this country. This is a great defect; for it is probable, that theſe different kinds of wheat are adapted to different ſoils; and this defect ſhould be remedied by the farmer. Would ſome perſons, conveniently ſituated, eſtabliſh a correſpondence with ſome farmers in England, and get from them annually a quantity of unmixed wheat, of ſuch kinds as are found beſt to ſucceed in the ſoils and climates of Scotland, they would not only find it of advantage to themſelves, but would alſo do a real ſervice to their country.

Wheat is commonly ſown either upon land that has been ſummer-fallowed, or after a crop of peaſe.

When we propoſe a crop of wheat after a crop of peaſe, the ſeed cannot be ſown till the month of October. But when we propoſe to ſow wheat upon fallow, the ſeed may be ſown in the month of Auguſt. In Scotland we ſow wheat from the beginning of Auguſt to the middle of November. It will not be amiſs to inquire, Whether there is any ſeaſon, during this period, more proper than another?

It is the general opinion, that the moſt proper ſeaſon is from the end of September to the middle of November. Some years ago, it was a cuſtom in ſome places in Scotland to ſow the wheat upon fallow in the month of Auguſt. This practice is now laid aſide, for this reaſon, that the crops were very bulky; but at the ſame time very deficient.

There is a particular ſeaſon in which every annual plant ſhould come to its height, to produce its ſeed in the greateſt perfection. If the ſeed is ſown before the time requiſite for this purpoſe, the plant grows larger. If the ſeed is not ſown till after this time, the plant is ſmaller. It is natural to ſuppoſe

poſe that this ſhould be the caſe, and the truth of it is diſcovered in a variety of inſtances.

In ſummer-fallowing, when a part of the field, after being plowed, is allowed to lye too long before it is plowed again, many of the weeds come to the flower, and begin to form their ſeed; but theſe weeds, if the ſummer is far advanced, are very weak when compared with thoſe of the ſame kind, upon no better land, that were allowed to grow earlier in the ſeaſon.

Some of the weeds that grow amongſt barley, are not ſo vigorous as thoſe of the ſame kind that grow amongſt oats or peaſe, when the land is equally rich.

Thoſe that have tried the ſowing of wheat in the ſpring, find that the plants are not ſo vigorous as when the ſeed is ſown in autumn, though the ears are ſometimes as well filled, and the grain as large. On the other hand, thoſe that have tried the ſowing of oats in autumn have obſerved, that the crop is very bulky, but the quantity of grain not in proportion to the quantity of ſtraw. If it is true then, that plants grow larger when their ſeed is ſown ſooner than is neceſſary to bring them to their height in the proper ſeaſon, and that they do not grow ſo large when their ſeed is ſown later than this time; it follows, that in every climate, the crop whoſe ſeed is too early ſown, is apt to prove a deceitful crop. For it is certain, that the more nouriſhment that goes to the ſtalk and leaves of a plant, the leſs remains to go to the ſeed: and if the early ſowing of wheat is a means to increaſe the bulk of ſtraw, it muſt for this reaſon proportionally leſſen the quantity of grain. Wheat in Scotland commonly comes to its height about the middle of June, and October is probably the proper time for ſowing, to bring it to its proper height at that ſeaſon.

But there is another thing that ſhould render a crop of early ſown wheat deceitful. It is certain, that wheat ſown in Auguſt is not eight days ſooner ready for cutting than wheat ſown on the ſame kind of ſoil in October. The time then that intervenes betwixt the ſowing and the ripening of the wheat ſown in Auguſt, is much longer than betwixt the ſow-

ing and ripening of the wheat ſown in October. Hence it is evident, that, as the vegetable paſture is always leſſening from the time that land is plowed, the early ſown wheat has not ſo large a paſture at the time of ripening as the latter ſown wheat, and conſequently cannot have ſo much food to nouriſh the grain.

But early ſown wheat is not only more apt to produce a deceitful crop than later ſown wheat, but it is alſo in greater danger of being hurt by ſpring froſts. Every plant ſuffers by froſt, and the farther that it is advanced, it ſuffers the more. A degree of froſt deſtroys a plant of wheat when in the ear, that ſcarcely affects it when young; and the nearer the plants are to this ſituation, they are in the greater danger. If the winter is mild, as it frequently is in Scotland, wheat ſown in the month of Auguſt is much farther advanced in the month of April, than wheat ſown in the month of October, though perhaps there may not be many days of difference in their coming to their height. Now, if we have ſevere froſts in April, as is often the caſe, particularly after a mild winter, the wheat ſown in Auguſt being farther advanced, is in much greater danger of being damaged.

As it appears improper, from what has been obſerved, to ſow before the firſt of October, ſo it ſeems likewiſe improper to delay this work till after the middle of November; for after this there is great danger of being interrupted by froſt or rain. As the rainy ſeaſon ſometimes ſets in early, it is neceſſary to make all poſſible diſpatch in ſowing after the middle of October. And it may not be amiſs to obſerve, that the cold and wet land ſhould be firſt ſown, and the warm and dry land laſt.

In determining the ſeaſon for ſowing wheat, I have had in my view particularly the warmeſt climates and ſoils in Scotland. In ſuch as are colder, it may be ſown more early than the firſt of October: The coldneſs of theſe ſoils and climates is a means of preventing the plants from riſing to too great a height

height before they put forth the ear, and makes early ſowing neceſſary, that the crop may be ripened in due ſeaſon.

Having determined the proper time of ſowing, it is neceſſary next to conſider what quantity of ſeed is requiſite. There is ſown, upon a Scots acre, from three to five firlots, Linlithgow meaſure *. The proper quantity is determined according to the ſituation of the land. In proportion as the land is clean and rich, a ſmaller quantity is requiſite; and in proportion as it is poor and full of weeds, a larger quantity is requiſite. Though land may be rich, yet if it is full of weeds, it is neceſſary to give it a large quantity of ſeed: for, when the ſeed ſprings up, if the corn does not ſoon cover the ſurface, and thereby prevent the weeds from vegetating, they ſpring up alſo, and endanger the crop. Agreeable to theſe maxims, we find that it is a common practice to ſow leſs ſeed upon fallow than after peaſe.

Some perſons recommend a wet bed for the wheat ſeed. This, conſidering the ſeaſon of the year in which wheat is ſown, is certainly a very good direction. In the month of Auguſt, or even perhaps in the firſt of September, it is dangerous to ſow, if there is not as much ſap in the land as to make the ſeed vegetate; and particularly, if the ſeed has been ſteeped in brine and dryed with lime. Mortimer aſſerts, that he has known "wheat muſtied and ſpoiled, ſo as never to come "up at all, that hath lain long in the ground before rain came."

Some of of the farmers in this country have obſerved the ſame thing.

When barley is ſown in May, and the drought becomes ſo ſevere as to prevent the ſeed from ſpringing, if the weather continues

* The Scots acre is to the Engliſh as 1 to .7954. The Linlithgow is the ſtandard meaſure of Scotland, and is the meaſure always meant in this treatiſe. The firlot of wheat and peaſe is a little larger than the Wincheſter buſhel, the firlot of bear and oats one third larger than the wheat firlot.

continues in this ſituation for three or four weeks, as is ſometimes the caſe, it may be obſerved that the barley comes up much thinner than ordinary, occaſioned poſſibly by the heat of the month of June. The heat of Auguſt may have the ſame influence upon the wheat.

But though there may be danger in ſowing when the land is very dry, and the heat very great, yet ſurely the moſt proper ſituation of land to receive ſeed of any kind, is when there is no more ſap than is neceſſary to make the ſeed vegetate. The juices in land are the richer, and contain the greater quantity of vegetable food, in proportion as the quantity of water in it is ſmall: and probably it is an advantage to have ſeed at firſt filled with the richeſt juices; for by this the young plant is rendered healthful and vigorous, and the more able to put forth its roots in ſearch of its food.

In preparing fallow for wheat, if there are many clods or hard pieces of earth on the ſurface, it is neceſſary to take the benefit of a ſhower to harrow the field well before the laſt plowing or ſeed furrow. This allows the dung, commonly laid on at this time, to be ſpread the more equally.

When the wheat land is light, or well reduced by fallowing, it is proper to plow in the ſeed, or let the land ly ſome time after it is plowed before the wheat is ſown. By this the land acquires a degree of firmneſs before the harrows go upon it, and thereby the feet of the cattle are prevented from preſſing too deep the ſeed upon which they tread. By this likeways the ſeeds of annual weeds are more encouraged to vegetate, and a greater number of the weeds themſelves deſtroyed: for when the land is plowed ſometime before the ſeed is ſown, two crops of weeds are deſtroyed, one by the harrow, and another by the winter froſt; but when the ſeed is ſown immediately after the plowing, one crop only is deſtroyed.

The wheat-land ſhould be plowed in ſuch a manner as to raiſe the ridges higher in the crown than is neceſſary on other occaſions. Land when plowed and harrowed, is in greater danger of being damaged by rain, than when it is plowed without

without being harrowed, or even when it is allowed to remain unplowed. Land that is plowed and harrowed, does not ſo eaſily part with the water which penetrates it, nor is ſo much expoſed to the influence of the winds, as when it is plowed without being harrowed: for harrowing renders it firmer, makes the ſurface ſmaller, and more even, and thereby prevents it from receiving ſo much benefit from the air or wind. Neither can land in this ſituation ſo eaſily reſiſt the rain, and make the water run off into the furrows, as when it is allowed to remain unplowed. In order therefore to prevent, as much as poſſible, the wheat-land from being damaged by water, it ought to be plowed in ſuch a manner as to raiſe the ridges higher in the crowns than ordinary; for thereby it is better enabled to reſiſt the rain, and throw it off into the furrows; and by expoſing a larger and more uneven ſurface, it receives the greater benefit from the winds. If the ridges are made narrower than ordinary, the ſame end is ſerved; for the narrower that the ridges are, the water finds its way the more eaſily to the furrows, and the winds have eaſier acceſs. Hence then we may obſerve, that the old practice in Scotland, the cleaving for peaſe, and gathering for wheat, was well founded; and alſo the practice in ſome parts in England, where the wheat-land is plowed in ridges of four or ſix furrows in breadth.

When the wheat is ſown, and the land harrowed, the field ſhould be carefully water-furrowed; and if there are ridges made at the ends for the plows to turn upon in plowing, a water furrow ſhould likewiſe be drawn betwixt them and the ridges, the communication betwixt the other furrows and theſe properly opened up with a ſpade; theſe furrows, if neceſſary, turned into drains, by being made deeper than the plough goes, and, if poſſible, a communication made betwixt them, and an open drain for carrying off the whole water.

The goodneſs of the crop depends in a great meaſure upon a proper attention to theſe things, without which the beſt ſcheme of agriculture cannot ſucceed.

ARTI-

ARTICLE XII.

The FARMER's KALLENDAR; or, a Monthly Directory for all ſorts of Country Buſineſs; containing plain inſtructions for performing the work of various kinds of farms, in every ſeaſon of the year. Reſpecing particularly, The buying, feeding, and ſelling live ſtock—The whole culture of arable crops—The management of graſſes—The oeconomical conduct of the farm, &c. *By an experienced Farmer.*

JANUARY.

SHEEP.

IN this month the farmer's ewes are generally lambing. Great care ought to be taken of them: they ſeldom want turnips before; for moſt farmers have graſs enough, either in whole fields, or in borders, &c. for lean ſtock ſheep to pick up a living till they are near lambing, when they ſhould have turnips regularly given them. The beſt method is to draw the turnips, and cart them to a dry gravelly paſture, and there bait the ſheep on them twice a day, obſerving well that they eat clean, and make no waſte; which is not a bad rule for the quantity neceſſary. In this way, the turnip crop goes much the fartheſt. On very dry lands, many farmers, for the ſake of manuring for barley, will eat the crop on the land, herdling off a certain quantity for the flock; and, as faſt as they eat them pretty clean, remove the herdles farther. This method ſaves much trouble; but it ſhould only be practiſed on lands that are perfectly and abſolutely dry, otherwiſe the ſheep poach it, and do as much miſchief as good. The crop, in the dryeſt land, will not go ſo far as if drawn and laid in a graſs field; for the ſheep dung, and ſtale, and trample on many roots after they are begun, which occaſions much

much waſte: nor is there any loſs of manure in carting them, only it is left, in one inſtance, on the arable field, and, in the other, on the graſs one; nor can any improvement be greater than this of feeding the ſheep with turnips; on whatever land they are given, the benefit is always very great.

It is further to be obſerved, that many ſheep are fattened on turnips, particularly wethers; in which huſbandry many turnips are waſted, if you have not two flocks; one lean to follow the fatting ſheep, to eat up their leavings; for they will not eat clean in fatting.

In very wet weather, ſtorms, or deep ſnows, the ſheep and lambs ſhould be baited on hay; ſome farmers drive them to hay ſtacks, which ſhelter and feed them at the ſame time; and ſheep in general do extremely well ſo; others give it in moveable racks; and allow a certain quantity every day. It is an excellent method to allow them in their racks a ſmall quantity of hay daily while on turnips, let the weather be good or bad; but it is not abſolutely neceſſary.

In ſome parts of the kingdom the beſt farmers give their ewes and lambs in this month bran and oats in troughs, while they are feeding on turnips; but it muſt be an extraordinary fine breed for ſuch a practice to repay.

FOLDING SHEEP.*

The farmers, even in thoſe parts of the kingdom which underſtand folding the beſt, and practiſe it the moſt, do not extend

* In England, great ſtreſs is laid on folding ſheep, even in the moſt improved farms, and the beſt ſoils. In Scotland, folding and tathing is little practiſed, but upon the outfield paſtures, before they are broke up. It is much to be wiſhed, that the practice was more general with us; and the advantages of it are ſo much praiſed by the Engliſh farmers, that there may be little doubt of its ſucceeding. The Scots farmer will object, that this cannot be

extend it ſo far as they might; they give over folding in *November* or *December*, whereas it may certainly be carried through the whole winter with profit. On thoſe farms which have a perfectly dry gravelly paſture or two, it is highly adviſeable to fold all winter on ſuch dry graſs land. It muſt not be attempted on arable land, nor on moiſt graſs; but on dry gravelly paſtures: the ſafety to the ſheep is undoubted, and the benefit to the graſs prodigious. But there is another method of gaining all the benefit of folding, quite through the winter, and on all ſoils; this is to confine them at night in a ſheep yard, well and regularly littered with ſtraw; ſtubble, or fern; by which means you keep your flock quite warm and healthy in bad ſeaſons; and at the ſame time raiſe a ſurpriſing quantity of dung; ſo great a quantity, if you have plenty of litter, that the profit will be better than folding on the land. And a great improvement in this method, would be the giving the ſheep all their food (except their paſture) in ſuch yard; *viz.* hay and turnips; for which purpoſe they ſhould be brought up, not only at night, but alſo to be baited about noon; but if their paſture be at a diſtance, they ſhould then come to the yard the earlier in the evening; and go out the later in the morning, inſtead of baiting

be practiſed in his incloſed grounds, from the certain danger to the hedges and young fences, by the ſheep nibbling them and paſſing through them. This may be true of the ſmall Scots breed, which leap like hares, and where food is ſcarce, will undoubtedly attack the hedges. It is the farmer's buſineſs to provide againſt the laſt, and if he will ſtudy to improve his breed by importing the larger kinds from England, there will be little danger of their deſtroying the fences by paſſing through them; for being much heavier, they are not ſo apt to jump, and beſides the profit from them is much greater, as the beſtowing the beſt paſture upon them is amply repaid by their more early lambing, and often bringing twins.

baiting at noon. This is a practice which cannot be too much recommended; for ſo warm a lodging is a great matter to young lambs, and will tend much to forwarding their growth; the ſheep will alſo be kept in good health; and, what is a point of vaſt conſequence to all farms, the quantity of dung raiſed will be very great. If this method is purſued through the months of *December*, *January*, *February*, *March*, and *April*, with plenty of litter, 100 ſheep will make a dung-hill of at leaſt 60 loads of excellent ſtuff, which, when rotten, will manure two acres of land amply, whereas 100 ſheep folded (ſuppoſing the graſs dry enough) will not in that time equally manure one acre.

FARM YARD.

In this month, a ſtrict attention ſhould be given to the cattle in the yard or yards—thoſe I mean which run looſe in them; take care that they are regularly ſupplied with ſtraw, and that they have always water at command; the thraſhers ſhould be ſo proportioned to the ſtock of lean cattle, as to make the ſtraw laſt juſt through the winter. Take good care alſo to keep the yard well littered from the ſtacks raiſed in the autumn, of ſtraw, ſtubble, fern, &c. ſo that the cattle may always lay perfectly dry and clean. Their health requires this attention; which ſhould, however, be given, were it merely for raiſing large quantities of manure.

COWS.

Several of your cows will probably calve in this month; about a fortnight before, they ſhould be taken into the cow-houſe from the ſtraw-yard, and be baited twice a day with green food; turnips, cabbages, carrots, potatoes, or whatever is the winter field food. After they calve they ſhould be ſeparated quite from the lean ſtock, either into the houſe or another yard, to be fed upon thoſe articles with ſtraw by them,

but to eat no more than they pleaſed. Hay muſt be baniſhed from this management, if you would make much profit by your cows: there certainly is no uſe in it, which is ſtrongly proved by ſeveral good farmers I know, who make turnips and ſtraw do without it; but this is for cows that are ſuckled: if they are milked, turnips muſt not be given, as they make the cream and butter taſte; and the latter then ſells at a low rate. Cabbages, or carrots, &c. ſhould then be ſubſtituted, but chiefly the former, which will maintain cows in the cheapeſt manner in the world, and make the butter perfectly ſweet; but you muſt pick off the decayed and yellow leaves, giving your cows nothing but the heart of the cabbage; the refuſe leaves will be eat clean up by the lean cattle. The great expence of winter feeding cows with hay eats up half the profit of the dairy; even if none be given till they calve; for ſuppoſe them to calve in *January* or *February*, there remains three or four months at hay.

FATTING BEASTS.

At this time, the farmer, who makes it his buſineſs to winter fat, is in the height of his work. There are three methods of fatting; carrying their turnips, &c. to a dry graſs field, to a farm yard, or to a houſe where the beaſts are tied up; the two latter methods are the beſt.—Scarcely any paſture is dry and ſound enough to bear the tread of an ox in winter. If you fat in a yard, the food, *viz.* turnips, cabbages, or carrots, muſt be given in mangers under open ſheds, with good ſtraw always in the racks, if hay is ſhort with you; but they will pay you well for hay; the ſame rule is to be followed in ſtall feeding; but obſerve to litter well, elſe they will preſently have a bound hide, and not thrive well from dirt; in either of theſe methods, you muſt be well provided with a vaſt quantity of litter. I would adviſe three waggon loads of ſtraw, ſtubble, or fern, to every beaſt, for ſo much they will make

make into dung, which ought to be your guide, and not the expence of the litter, as the dung will repay that with great profit. I am ſenſible leſs will do; but always remember, that the raiſing dung in winter is the grand pillar of your huſbandry.

SWINE*.

This is a principal ſeaſon with ſwine, both for fattening, rearing, and bringing forth. As the two firſt are mentioned largely under other months, I ſhall, at preſent, ſpeak only of the management of your ſows and pigs. They muſt be kept each litter in a ſtie, and fed with dairy wath, out of your ciſterns, and with the food you ſtored for them in autumn, either carrots, parſnips, or potatoes. Theſe roots do all excellently for them; to ſubſtitute barley or peaſe, or even purchaſed brand or pollard, is therefore a moſt unprofitable conduct. The ſows ſhould always have as much as they will eat, or the pigs will ſuffer; and what is of as much conſequence, is keeping them well littered: let them be always perfectly clean; it enſures the health of the pigs, and, at the ſame time, raiſes you a large quantity of the beſt manure, about a farm.

HORSES.

One of the moſt uſeful general leſſons, that can be given to an arable farmer, is to keep his horſes always at work: the expence

* The huſbandry of ſwine is little known among the farmers in Scotland, excepting in the North country, particularly about Aberdeen: Elſewhere it is moſtly confined to millers and diſtillers. In England it is a very material part of ſtock, and great profit is made of them. Is it not a ſhame to this Country to be obliged to our Neighbours for all our cured bacon, of which the quantity imported to Edinburgh alone is amazing? when our farmers might, with a little attention, ſupply the market to their own great benefit, and a ſaving to the Country.

expence of a team is ſo great, that, if he does not purſue this rule, he muſt loſe by them. *January* is a month, in which all buſineſs of tillage ought to be at a ſtop: if the weather is a hard froſt, care ſhould be taken, to make uſe of it in carting manures on the farm; if you have compoſts ready for the barley land, do not let a froſt ſlip; or, if you have faggot carting, or the earth of borders under hedges to carry on, keep the carts cloſe to it as long as the froſt laſts. But, if the weather is open, road work muſt be done; carting out the corn will not near employ the teams; all other days the waggons ſhould go to the neareſt town for manure. There certainly are ſituations precluded from this advantage, but not many; how well it would anſwer to keep a team on purpoſe for the employment, depends on various circumſtances; but we may be aſſured, that it muſt always anſwer greatly to employ the teams about it, when they would otherwiſe ſtand ſtill; for then the expence is little more than labour, and wear and tear.

The ſame obſervations are applicable to the ox teams; and the farmer ſhould have a ſtrict eye, that both horſes and oxen have plenty of litter; otherwiſe his farm will ſuffer in a deficiency of manure.

THRASHING.

In the thraſhing the crops of corn and pulſe, I before remarked, that the farmer ſhould be attentive to proportion his thraſhers to the ſtock of lean cattle, that neither more nor leſs ſtraw may ariſe, than is regularly conſumed. Relative to the management of the thraſhers, the farmer ſhould be very clear ſighted to their motions, both as to the cleanneſs of their work, and to their honeſty: he may loſe immenſely, if his ſtraw is not thraſhed clean; and, as it is a work generally performed by meaſure, the men are too apt to turn over the ſtraw too quick, and thraſh out only that corn, which comes

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the eaſieſt from the ear. In reſpect to pilfering, the work gives them greater opportunities for it than any other; for which reaſon, he ſhould have a ſharp look out, and take care now and then to meet the men of an evening in their way home, and to come upon them in the barn, at various times, and unawares. Such a conduct will keep men honeſt, if they are ſo already, and prevent many knaves from practiſing their roguery; whereas an indolent inattentive maſter will make pilferers.

FENCES.

This is a principal ſeaſon for hedging and ditching. A farmer cannot give too much attention to the fences of his farm; for, without good ones, he might as well cultivate open fields; he cannot manage them as he pleaſes, but is for ever cramp, for fear his own or other people's cattle ſhould break into his corn or hay fields. In fencing, it ſhould be determined to execute the work in the beſt manner, which is the plaſhing method. It is done in the following manner; the men firſt clear the old hedge of all the dead wood and brambles, and other irregular growing rubbiſh, leaving along the top of the bank the ſtraighteſt and beſt growing ſtems, whether thorns, hazel, elm, oak, aſh, ſallow, beach, &c. about five or ſix in a yard; but, if there are any gaps or places thin of live wood, on each ſide of ſuch places they leave the more. When this work is done, they repair the ditch; I ſhould never adviſe a leſs than three feet by two and a half, and ſix inches wide at bottom, in the drieſt ſoils; but, in all wet or moiſt ones, never leſs than four by three, and one at bottom. All the earth that ariſes from the ditch is to be thrown on to the banks. Your men, if you do not bargain with them before hand, will lay ſome of it on the brow of the ditch; but this muſt never be allowed, unleſs the ditch earth happens to be extraordinary rich, and to pay well for carrying

carrying on to the land, otherwiſe the graſs of the border is ſpoiled, and you are at the expence of carting earth, and is worth but little. When the ditch is finiſhed, the men begin the hedge; they firſt lay a thin layer of dead brambles or buſhes along on the bank hanging towards the ditch; then they obſerve, among the ſtems left in the cutting the hedge, ſuch as grow in the line where the new hedge is to run, and cut them off about three feet from the top of the bank, to ſerve for hedge ſtakes to the new hedge. This practice cannot be too much commended; for theſe ſtakes being immoveable, and never rotting, keep up the new hedge, ſo that it never falls, or leans either way. Next they drive in their dead hedge ſtakes where wanted, chuſing ſallows or willows, that they may grow. The hedgers then plaſh down the remainder of the live wood left ſtanding, they cut the ſtick twice, one ſtroke near the ground, and the other about 10 or 12 inches higher, and juſt deep enough to ſlit out a part of the wood between the two, leaving the ſtem ſupported by little more than the bark, or about a quarter of its firſt ſize; it then is laid along the top of the bank, and weaved among the hedge ſtakes. All are ſerved thus; and, where they are not thick enough to finiſh the hedge, dead thorns are wove among them; then the top of the hedge is eddered in the common manner.

The fence thus made, conſiſts of a good ditch and a hedge, moſt parts of which are alive; that is, the ſtakes, and much of the wood that is weaved between them. The importance of having as much as poſſible of the hedge alive, cannot be too ſtrongly impreſſed. This management enſures a laſting fence; whereas the hedges that are all dead, preſently rot, and fall into the ditch. Thoſe farmers, who live in countries that know nothing of the plaſhing method, cannot give too much attention to teaching their men; the beſt way is, to ſend for labourers from the plaſhing countries, who, in one ſeaſon, will

will eaſily inſtruct his regular men in the buſineſs, which they may afterwards perform without difficulty.

DRAINING.

January is as propera ſeaſon for draining as any in the year. As to which ſee the particular directions concerning the different kinds of Drains given in our Firſt Volume, Art. XXI. p. 156.

ARTICLE XIII.

Curious obſervations on the Weather, and the uſe of the Barometer, when applied to improvements in Agriculture.

[From De Re Ruſtica.]

THE many advantages ariſing to the induſtrious farmer from a fore-knowledge of the changes of the weather, and the example ſet us by the ancient writers on huſbandry, are ſufficient enducements for endeavouring to draw the attention of huſbandmen to obſervations, which muſt be highly uſeful to them.

It might have been expected, that as ſuch great improvements have been made in natural enquiries during the two laſt centuries, a more accurate account of weather might have been attained; yet the earlieſt writers on huſbandry ſeem to have eſtabliſhed more certain prognoſtics of the changes of the weather, peculiar to their climates, than any have done for ours; though it may be preſumed, that the operations of nature are ſet in a much clearer light to us, by means of the many diſcoveries made by the moderns.

The ancients, obſerving, that the weather of each ſeaſon ſet in nearly at a ſtated time, imputed the qualities of the weather to the influence of ſome ſtars which happened then to riſe

riſe or ſet. In after-times, monks and deſigning prieſts, being willing to procure every merit to their ſaints, transferred the ſuppoſed influence of the ſtars, to the ſaint whoſe commemoration happened near the ſame time. The moderns, being ſenſible that the inconceiveable diſtance of the fixed ſtars, and the ſmallneſs of our neareſt planets, muſt render their influence on our atmoſphere of no effect, and having little faith in ſaints, have perhaps injudiciouſly, rejected the obſervations of the ancients, without duely conſidering, that the facts might have been diſcovered firſt; and the ſtars and ſaints only called in, to account for theſe facts. The ancients indeed acted more rationally than the monks, in not fixing the changes to a day, but only to ſtated times of the year, as appears from Columella and Pliny.

As ſome of the planets, eſpecially Venus and Mars, are obſerved to diſturb the motion of the moon, and as the moon acts ſo powerfully on the tides, it has been thought probable by ſome moderns, that the moon and planets, together with the ſun, might be the cauſes of the moſt conſiderable changes in our atmoſphere, while others, with perhaps more reaſon, ſeek for theſe cauſes in the earth itſelf. In all doubtful matters, in which experiments or obſervations can be called in to our aid, experiments or obſervations ſhould decide the queſtion. Accurate journals of the weather ſeem to be here the proper vouchers; but even theſe are at preſent rather in diſgrace with modern philoſophers, who, finding that they cannot trace out the cauſes of the changes in the height of the barometer, an inſtrument which they can have conſtantly under their eyes in their cloſets, thence too haſtily conclude, that no uſeful inferences can be drawn from obſervations on the weather: however, Mr Claridge, who in the year 1744 publiſhed *The Shepherd of Banbury's Rules to judge of the Changes of the Weather*, was of a very different opinion, when he expreſſes himſelf as follows:

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"The ſhepherd, whoſe ſole buſineſs it is to obſerve what has "a reference to the flock under his care; who ſpends all his "days, and many of his nights, in the open air, and under "the wide ſpread canopy of heaven; is obliged to take parti-"cular notice of the alterations of the weather: and when "he comes to take pleaſure in making ſuch obſervations, it is "amazing how great a progreſs he makes in them; and "to how great a certainty he arrives, by mere dint of compa-"ring ſigns and events, and by correcting one remark by "another. Every thing, in time, becomes to him a ſort of "weathergage. The ſun, the moon, the ſtars, the clouds, "the winds, the trees, the flowers, and almoſt all vegetables "and animals, with which he is acquainted, all theſe become, "to ſuch a perſon, inſtruments of real knowledge'—What Mr Claridge ſays of the ſhepherd, may, with nearly equal reaſon, be ſaid of the farmer.

The ſlighteſt obſervation will convince every man, that each year, and the various ſeaſons of the year, have a peculiar character, as to rain, drought, heat, cold, &c. and as the quality of the ſeaſons has a moſt ſenſible effect on the productions of the earth, it is evident, that it muſt be of the greateſt advantage to the farmer to foreſee the changes that may be expected; becauſe he can thereby regulate his labours accordingly.

When the character of the ſeaſon is once aſcertained, the returns of rain, or fair weather, may be judged of with ſome degree of certainty in ſome years, and but ſcarcely gueſſed at in others, by means of the barometer; for in general we may expect, that when the mercury riſes high, a few days of fair weather will follow. If the mercury falls again in two or three days, but ſoon riſes high, without much rain, we may expect fair weather for ſeveral days; and in this caſe, the cleareſt days are after the mercury begins to fall. In the ſame manner, if the mercury falls very low, with much rain; riſes ſoon, but falls again in a day or two, with rain; a continuance of

bad weather may be feared. If the ſecond fall does not bring much rain, but the mercury riſes gradually pretty high, it prognoſticates ſettled good weather of ſome continuance. When a heavy rain has fallen upon the mercury's ſinking, and its continuing ſteadily low, the weather is ſometimes fair, and promiſes well; but no prudent farmer ſhould truſt to ſuch appearances. There is indeed a caution of this kind, which the pooreſt may profit by. When the mercury riſes high in the barometer, the air ſucks up all the moiſture on the ſurface of the earth, even though the ſky be over-caſt, and that is a ſure ſign of fair weather: but if the earth continue moiſt, and water ſtands in ſhallow places, no truſt ſhould be put in the cleareſt ſky, for it is in this caſe deceitful.

The character of the ſeaſons is leſs ſteady at the equinoxes, and more regular during the intermediate months. Thoſe who favour the celeſtial influence on the atmoſphere, think, that the changes of the weather are much regulated by the moon's place in the zodiac, or by her ſituation with regard to the ſun; but obſervation has not yet aſcertained any thing on this head.

Whatever the cauſes of the changes in the weather, or, what is nearly the ſame, in the motion of the quickſilver in the barometer, may be, whether celeſtial or terreſtrial, their effects are generally felt over a conſiderable extent of country at the ſame time. Every one may be aſſured of this, by comparing accounts, kept at diſtant places, of the play of the barometer. They will find, that the great falls or riſes happen nearly at the ſame time, in almoſt all the northern countries of Europe; I ſay nearly, becauſe a difference will be obſerved, uſually attending the direction of the wind. If theſe cauſes were celeſtial, the effects would be univerſally the ſame, except where varied by the ſituations with regard to ſeas, mountains, &c. As this is not the caſe, the cauſes muſt probably be ſought for in the earth. This opinion is favoured by the obſervations of miners, who have been generally ſenſible of

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ſome prognoſticating circumſtances in mines, before any change of the weather appeared in the air.

Even the limited fore-knowledge, which is pointed out above, would be of ſervice; for inſtance, in the month of Auguſt, when it would be of conſiderable advantage to judge when hay ſhould be cut, with a proſpect of fair weather to make it; and at all ſeaſons of the year, in order to get ready every thing neceſſary for carrying into execution the works uſual in every ſeaſon.

Mr Du Hamel has very judiciouſly added to his journals of the weather, an account of the ſtate of all the vegetables or animals uſeful in the farm; or, what is the ſame, of the effects of the weather on them.

The ancients have obſerved, that the early or late arrival of birds of paſſage indicate the nature of the approaching ſeaſon; whether it will be early or late, ſevere or mild. Linnæus has, in the ſame manner, adviſed huſbandmen to mark the firſt ſigns of a beginning vegetation of plants growing wild, and natives of the climate; for that ſuch, by their early or late ſhooting, inform the attentive farmer of the approach of ſpring. He adviſes the husbandman to extend theſe remarks to different plants, whoſe vegetation has been obſerved to coincide with the times of ſowing particular ſeeds. Theſe are objects highly worthy of a place in a journal of the weather; as theſe facts will, from year to year, remain a regiſter of the ſtate of every article, which in any degree relate to rural oeconomy. I ſhall readily ſend you what obſervations occur to myſelf on theſe ſubjects, and ſhall be glad of thoſe of other obſervers, that every poſſible light may be caſt on theſe ſubjects.

In the latter end of March, or generally in the beginning of April, the barometer ſinks very low, with bad weather; after which, it ſeldom falls lower than 29° 5′, till the latter end of September or October, when the quickſilver falls again low, with ſtormy winds, for then the winter conſtitution of the air takes place; from October to April, the great falls of the barometer

rometer are from 29° 5′ to 28° 5′; ſometimes lower: whereas, during the ſummer conſtitution of the air, the quickſilver ſeldom falls lower than 29° 5′. It therefore follows from hence, that a fall of one-tenth of an inch, during the ſummer, is as ſure an indication of rain, as a fall of between two and three tenths is in the winter.

It muſt be obſerved, that theſe heights of the barometer hold only in places nearly on a level with the ſea; for experiments have taught us, that for every eighty feet of nearly perpendicular height, the barometer is placed above the level of the ſea, the quickſilver ſinks one-tenth of an inch: now by an accurate compariſon between the motion of the barometer in inland and higher places, with its motion in a place on a level with the ſea, the heights of theſe inland places may be pretty nearly aſcertained; and obſervations muſt determine the heights of the quickſilver, which in each place denote fair and foul weather.

In all places nearly on a level with the ſea, rain may be expected, when the quickſilver falls below thirty inches. This points out one cauſe of the more frequent rains in lofty ſituations, than in low champaign countries. Thus double the quantity of rain falls at Townly-hall in Lancaſhire, that does at London.

Very heavy thunder-ſtorms happen, without ſenſibly affecting the barometer; and in this caſe, the ſtorm ſeldom reaches far. When a thunder ſtorm is attended with a fall of the barometer, its effect is much more extenſive. And here I muſt mention an obſervation which I have often ſeen verified, viz. that when the quickſilver falls very low, the weather continuing mild and the wind moderate, a violent ſtorm happens at that time, in ſome diſtant place: this accounts for a falſe prognoſtic, that the barometer has been often unjuſtly charged with.

One cannot foreſee what uſeful diſcoveries may occur by means of continued obſervations and communications of this kind.

ind. "The race is not always to the ſwift, nor the battle to the ſtrong:" even ſo, uſeful hints may occur to the countryman, uninformed in philoſophical principles.

*** The Editors are greatly obliged to this gentleman for his curious obſervations, and could wiſh that ſome gentleman in the weſt, or ſouth-weſt, and another in ſome part of the north of England, would make the like obſervations, and favour them with copies. If ſuch obſervations were begun, ſay, the firſt of January next, and continued for ſome time, the Editors will readily lay them before the public; as they flatter themſelves, that many valuable diſcoveries may be made, and applied to the improvement of agriculture.

ARTICLE XIV.

Method to keep Corn ſweet in Sacks, by Dr Stephen Hales.

[Gentleman's Magazine, Vol XV.]

HAVING lately thought of a very cheap and eaſy way to preſerve corn ſweet in ſacks, as it will be of great benefit to many farmers and others, and eſpecially to poor cafers, who want to keep for ſome time ſmall quantities of corn, but have no proper granary or repoſitory for that purpoſe, I thought it my duty to inform the public of it.

Provide a reed cane or other hollow ſtick, made ſo by glewing together two ſticks grooved hollow: let it be about three feet nine inches long; and that it may be the eaſier thruſt down to the bottom of the corn in a ſack, its ſmalleſt end is to be made taper to a point, by a wooden plug that is fixed in and ſtops the orifice. About 200 ſmall holes, of an eight of an inch in diameter, are to be bored on all ſides of the ſtick, from its bottom to two feet ten inches of its length; but no nearer to the ſurface of the corn, leſt too great a proportion of

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the air ſhould eſcape there. By wreathing a pack-thread in a ſpiral ſcrew like form round the ſtick, the boring of the holes may the better be regulated, ſo as to have them about half an inch diſtant towards the bottom, but gradually at wider diſtances, ſo as to be an inch aſunder at the upper part, by which means the lower parts of the corn will have their due proportion of freſh air. To the top of the ſtick let there be fixed a leathern pipe ten inches long, which pipe is to be diſtended by two yards of ſpiral wire coyled up within it. At the upper end of the pipe is fixed a wooden faucet, into which the noſe of common houſhold bellows is to be put.

Common large kitchen bellows worked, convey about three pints of air at a ſtroke; but ſuppoſing it to be but a quart of air, then at the rate of ſixty four ſtrokes in a minute, they will convey a quantity of air, equal to the capacity of a four buſhel ſack in two minutes. And ſince one ſeventh part of the ſpace that wheat takes up, is the quantity of meanders among the corn, which are full of air, a quantity of freſh air equal to it will be blown in among the corn with leſs than twenty ſtrokes. So that if corn, when firſt put into ſacks, be thus aired every other or third day, for ten or fifteen minutes, its damp ſweat, which would hurt it, will in a few weeks be carried off to ſuch a degree, that afterwards it will keep ſweet with very little airing. But if corn be got ſtale by ſtanding long in ſacks without airing, it would be too much work to attempt to ſweeten it by this method; it is therefore beſt thus early to prevent that ſtaleneſs.

Where many ſacks of corn are thus to be preſerved ſweet, it may be well to have much larger bellows with wider noſes, for the wider the noſes, they will be worked both the eaſier and the faſter. If the ſacks are placed ſo that cats can go between them, it will prevent the mice eating them.

By the ſame means, many other kinds of ſeeds, as well as corn, may be kept ſweet, either in ſacks or ſmall binns: but then the air holes muſt be made only nearer the bottom of the

the canes, becauſe it muſt all aſcend upwards, ſince it cannot go through the ſides of the binn, as it will through ſacks.

But this method will not do for very large quantities of corn in granaries or in ſhips; which muſt be kept ſweet and dry by means of large ventilators proportioned to the bulk of thoſe quantities of corn.

As it will be of great ſervice to farmers and moſt other country people, it were to be wiſhed that they were readily accommodated with theſe inſtruments, which will be ſo cheap, and are ſo eaſily handled.

ARTICLE XV.

Of the culture of Hog peas in Hertfordſhire.

[From the MUSÆUM RUSTICUM, Vol. I.]

WE are very fond, in the county I live in, of ſowing grey peas, not only by way of changing our crops, but becauſe we imagine the culture they require is of great ſervice to the land, by keeping down the weeds, and bringing the ſoil to a fine tilth for future crops

In our light lands we moſt of us prefer ſowing peas to beans, as the latter naturally require a ſtiffer ſoil, and do not give us ſuch large returns; neither is the haulm ſo good, as it will not ſerve for ſtover for our cattle in the winter, when we are moſt in want of it; but the peas ſtraw is excellent for this purpoſe, being very nouriſhing and ſweet; and the cattle are very fond of it, as it agrees very well with them when given with diſcretion: it is much beſt when mixed with ſtraw.

All our cattle eat it almoſt with greedineſs, horſes, cows, and ſheep; but horſes that are often put into quick motion ſhould not be fed with it: it agrees beſt with draught-horſes. The grey pea, which we in general ſow in our fields, makes excellent

excellent food for our hogs, which fatten on them ſooner and better than on any other food.

We alſo give them inſtead of oats to our horſes; but in this matter we are very cautious, as it is neceſſary they ſhould thoroughly dry before the horſes taſte them; and, indeed, it is by much the ſafeſt way to have them firſt dried in a malt-kiln, when they become excellent provender, and will maintain the horſes under the hardeſt labour; another very particular reaſon for our farmers giving their horſes ſo many peas is, that they go much farther, and are cheaper food than oats in general are: on this account moſt of our oats are ſent to market.

On our chalky, ſandy, or light loams, we ſow our grey peas in the broad caſt, and plow them in, or elſe we ſprain them in under furrow. This method ſecures them a ſufficient covering, which they would not otherwiſe have if they were only harrowed in: but the crop would be ſubject to be ruined by the leaſt dry weather, which often happens after pea-ſeed time. *

In theſe light lands we love to ſow early, that the young plant may have all poſſible benefit from the ſpring rains, which bring them forward, and make them pot better, by being at the bearing time better rooted.

We ſow our peas in this manner on light lands with a ſingle plowing †, allowing often five buſhels of ſeed for an acre, when it is ſown in the broad-caſt way; but three buſhels, or at moſt three and a half, are enough, if the ſeed is ſprained in by a man's hand after the plow: and this, indeed, is the

* The better tilth land is in when peas are ſown, the better will be the crop; they thrive better, for this reaſon, on land that has borne firſt a crop of wheat, then another of barley: all the plowings both ſorts of corn had, are of benefit to the peas.

† For peas to be ſown after a ſingle plowing, the land ought before to be in good tilth, and well broke, or the crop will be indifferent.

the beſt way of doing it, as it not only ſaves ſeed, which is often a matter worth attention, but the crop comes up in regular rows, and is eaſier weeded or hoed.

We generally ſow this ſeed in February, for the reaſons above-mentioned, contriving to have done before March; the heavy ſtiff lands we always ſow laſt.

Peas are, in general, very tender; but ſome of the hardy kinds will be, to all appearance, dead two or three times in a ſpring, and yet recover and bear a good crop.

Some ſow their grey peas in January; but this is not ſo ſafe a method, as we have often hard froſts in that month; whereas, after the firſt week in February, the froſts are ſeldom of long duration.

About a week after my peas are ſown, I give my land a rolling, my light land I mean, to ſettle the earth about the ſprouting pea; and, for this purpoſe, I generally make uſe of a tolerably heavy roller, for a light one does little ſervice. Light ſoils are porous and hollow: therefore they require preſſing, to lay their parts cloſer together, and keep out the chilling froſts, winds, and cold rains, which would otherwiſe, and frequently do, deſtroy the infant plant before it appears above ground *.

Some farmers are great ſlovens in their pea-fields, but I always allow my peas one or two hoeings, according as the ſummer is wet or dry, and ſometimes a weeding beſides; and this method I find it of infinite advantage to practiſe, as the ſucceeding crop, be it what it may, is always remarkably clear of weeds †, none of thoſe pernicious vegetables having been ſuffered to perfect their ſeeds, whilſt the pea-crop was on the ground.

* This practice of paſſing the roller over light, porous, and hollow land, is to be commended.

† If peas are ſown thick, they naturally keep down the weed; but if ſown in rows with any kind of intervals, hoeing is neceſſary,

By theſe methods of practice I get very good crops of peas from my light chalky loams; but I do not, in every reſpect, manage in the ſame manner on ſome ſtiff clayey land I have ‡.

On this ſoil I ſow my peas ſomewhat later, perhaps a fortnight; and I allow the land two plowings before I ſow my peas, that *it* may be looſened, and made as hollow as poſſible, being by nature too compact and cloſe. I here ſow peas in the broad-caſt way, and harrow them in; but I do not roll them, as it would be apt to knead the land, and form a cruſt on its ſurface, which would prevent the tender ſhoot of the pea from being able to make its way to the air.

I alſo allow leſs ſeed, at moſt three buſhels, often not much above two, for an acre; and this heavy land does not require ſo much weeding or hoeing, as the weeds are not here of ſuch ready and quick growth.

I have, as well as many farmers who live near me, yet another method of ſowing theſe peas,, and that is, on land that is of a middle nature betwixt light and heavy. My uſual practice then is to ſow half my quantity of ſeed broad-caſt, and plow it in; after which I ſow the other half on the ſame land, and harrow it in with a long tined harrow, in the ſame manner I do on my ſtiff lands.

Again, on ſome ſtiff ſpewy land I have, I ſow my peas in ridges, to keep them from too much moiſture: but when I ſow them this way, I am under a neceſſity of hooking inſtead of mowing my crop, which is an inconvenient and ſlow method; therefore, for the moſt part, I think, to be avoided.

Theſe then in general are the methods we purſue in this country in the culture of the grey pea; a corn which we are very fond of, and not without reaſon, as an intermediate crop.

We

‡ Sowing peas on ſtiff lands ſhould, if poſſible, be avoided; beans are much the beſt for ſuch ſoils.

We often, indeed, ſuffer by this our fondneſs; for if a dry ſummer comes on, the crops of peas in a whole diſtrict are ſometimes deſtroyed in a trice by ſlugs, which are very greedy of this food, on account of the particular ſweetneſs of its ſap.

We have no certain method of guarding againſt this dreadful evil, any more than againſt the ravages of game and field-fowls, ſuch as pigeons, &c. which deſtroy great quantities of the ſeed immediately after ſowing: all we can do, is to allow ſuch a quantity of ſeed, as that, after all theſe loſſes, there will ſtill be enough left to ſupply a full crop; and this, indeed, is the principal reaſon of allowing, for our light chalky lands, ſo large a quantity of ſeed as five buſhels, which would be at leaſt as much again as would be neceſſary, was it not for the ravages above mentioned.

ARTICLE XVI.

Soot a proper dreſſing for Meadows, and recommended as a Manure for Clover.

[From the MUSÆUM RUSTICUM, Vol. I.]

MANY farmers, in ſome counties, are at a great loſs to find a proper dreſſing for their meadows: to ſuch I would recommend the uſe of coal-ſoot, than which nothing can be more profitable and advantageous; its effects will be very viſible for upwards of three years, during which time no other manure need be laid on the land.

Coal-ſoot * is of a very warm refreſhing nature; it cheriſhes and

* Soot is an excellent dreſſing for green wheat in February: it ſhould be ſown by hand, in quantity ſufficient to blacken the land. This is frequntly practiſed in Leiceſterſhire, and many other counties. It is of a warm nature, therefore it does moſt good on cold, moiſt, clayey ſoils.

and gives nouriſhment to the graſs; it kills the noxious inſects that infeſt the crop, and protects it from the effects of froſts, ſnows, and chilling rains; and, what is ſtill of greater conſequence, it will kill the moſs that ſo often abounds in ſour meadows †.

I muſt not, however, fail noticing, that ſoot will not have theſe good effects if the meadow land ſhould be ſo damp as to require draining: in this caſe cuts muſt be made acroſs it, in proper directions, previous to the laying on the coal-ſoot, which would otherwiſe be of little ſervice.

All rank weeds ſhould be carefully grubbed up from among the graſs, and that before they have perfected their ſeeds; without which precaution, in point of time, the work would be to do over again.

The general quantity I lay on an acre of meadow land is twenty five looſe buſhels; more I find to be rather prejudicial, and leſs does not anſwer all the purpoſes we are to expect from this excellent manure.

The beſt time for applying this dreſſing, I take to be the beginning of the ſpring: about February is the time I generally lay it on *; the gentle rains which then, for the moſt part, enſue, waſh it in to the land, and the following crop is greatly benefited by it. This is very ſoon viſible from the fine deep verdure which the graſs aſſumes.

Some of my meadow land is particularly ſubject to be damaged by froſts, ſnows, &c. On this I generally lay the proper quantity

† The winter is the proper ſeaſon for ſowing ſoot on meadow ground.

* We have already mentioned we think it beſt done in winter, and that for this reaſon, viz. that the firſt rains after the froſt breaks will waſh it in to the land, and warm and cheriſh the roots of the graſs; whereas when it is laid on in the ſpring, it may by its great heat affect the blade and heart of the graſs, and for a time at leaſt, ſtop the progreſs of its vegetation.

quantity of ſoot in the beginning of November; and ſometimes, if the winter is likely to be ſevere, I venture to allow thirty buſhels to an acre, which in other caſes I never do.

I have, by experience, found coal aſhes and ſoot a moſt excellent manure for clover, as it ſecures this crop from drought, and brings it greatly forward.

I generally ſow on my ſecond year's crop of clover as much ſoot as will cover the land very thinly over, which is about fifteen buſhels; and this I do in the month of February, ſoon after which the ſpring rains waſh it in to the ground, and the plant thrives amazingly.

The ſame may be ſaid of coal aſhes, which I lay on thicker, to the quantity of, at leaſt, forty buſhels on an acre; from which I find a great advantage.

The farmer who attempts to ſow ſoot over his clover, muſt take care to do it very thin and regular; for if it falls in lumps, it is ten to one but it gives the hay, made that ſummer, a bitter, diſagreeable taſte, very unpalatable to the cattle which eat it.

I have often found it uſeful, on my ſtiffer loam, to ſow with the ſoot an equal quantity of ſand, which helps to ſpread it regularly; and on light land I often mix it with an equal quantity of ſlaked lime, both which have a very good effect.

Having myſelf found great benefit by uſing this coal-ſoot I am willing my brother farmers ſhould know it, that they may have it at their option to adopt the practice if they approve of it.

It will be very well worth their while, provided they can have it at a reaſonable rate, which they may, above twenty miles from London, by land-carriage, and wherever there is a communication by water, though at almoſt ever ſo great a diſtance.

Other great towns alſo, where ſea or pit coal is burnt, may ſupply the farmers with it; but the misfortune is, that where it is in the greateſt plenty, they leaſt know the uſe of it.

Great

Great care, however, ſhould be taken to get it genuine and good, the *merchant chimney-ſweeper* frequently, to encreaſe the bulk, mixing fine ſifted coal-aſhes with it; this is a great fraud, but may eaſily enough, with proper care and circumſpection, be diſcovered; for the aſhes make the ſoot gritty, and encreaſe its weight in a very ſenſible degree.

Before I conclude this letter, I muſt give my brother farmers a caution; which is, that they never lay the ſoot on land in windy weather, as not only great part of it will be loſt and waſted, but the remainder will be ſo unequally diſpoſed as to do rather more harm than good.

Should any thing elſe occur to my recollection, which may be of ſervice to the lovers of agriculture, and proper to be inſerted in your collection, I ſhall not fail communicating it to you, being firmly of opinion that I ſhall thereby merit ſomething of my country; and, indeed, I ſincerely wiſh this ſame motive would prompt every one, capable of doing it with propriety, to write you the reſult of their experience, in the ſubjects of which your work is to conſiſt.

ARTICLE XVII.

Method of burning Clay, and the benefit of it as a Manure.

[From the MUSÆUM RUSTICUM, Vol. I.]

AS you ſeem deſirous of having an account of whatever may be advantageous to the public, I have traſmitted you one of a manure, which I found very beneficial; which you may either publiſh, or not, as you think proper.

I obſerved our lands, (for I then lived in a wet clay country) after having borne three crops of corn, which is the common method of huſbandry in thoſe parts, produced good quantities of graſs for two or three years; after which the ground

ground began to *ſadden*, and then the produce diminiſhed, and ruſhes grew in abundance.

This led me to think, that whatever would contribute to keep the particles diſunited would be of great ſervice; and, further I imagined, that clay or ſoil burnt would never reunite; which proved a fact: moreover, that the ſalt it gained by paſſing through the fire would enrich the land, which appeared from its produce when denſhired *; though I never approved of that huſbandry, as the ſoil was thereby diminiſhed, which is already too thin in that country. This determined me to attempt burning clay, which I did in the manner following.

I cauſed a labourer to dig as much clay as made a number of walls of nine inches high, and of the ſame thickneſs, and the ſame diſtance from each other, in a parallel direction, as would make about a ſquare of three yards: theſe vacancies, being like tunnels of brick-kilns, I filled with bruſhwood, and on that threw ſome cinders, or ſmall coal, of which I had ſufficient quantities, then living nigh ſome coalleries; after which I covered the whole ſquare with clay about three inches thick, leaving the ends of the tunnels open, which I then lighted on the windward ſide: as ſoon as the fire had got ſufficient head, I ſtopt the mouths of them; and when I perceived the covering was almoſt burnt through, I had a ſmall ſprinkling of cinders, or ſmall coal, thrown on the heap, and then another covering of clay of the ſame thickneſs; and thus I went on till my fire was ſeven or eight feet high.

When I found my fire was very well kindled, which was commonly about the time I put my ſecond coat on, I uſed to enlarge the baſe of the fire, by continuing the tunnels, and by adding new ones to the ſides, (which were filled and covered

* Denſhiring, or burnbaiting, can very ſeldom be practiſed without injuring land, unleſs the ſoil happens to be very deep, ſo that it may be renewed by deep plowing.

vered as the others, and then lighted) till I made my fire about ſeven yards ſquare; for I ſoon found it never burnt well in the middle, if it was ſo large at firſt.

Care ſhould be taken the labourer does not put on too thick a coat at once, as it will be apt to ſmother the fire; beſides, by confining the heat in too much, the clay was apt to run and vitrefy, which was then of little uſe.

As ſoon as the heap was ſufficiently cool (for the ſooner it is laid on the land the better) I put about ten large cart-loads on a ſtatute acre, and found it an admirable manure for either meadow, paſture, or corn: for the latter it will not laſt more than three crops, though longer for the two former; and with this I have made prodigious improvements; but I don't believe it will anſwer for a ſandy ſoil, as it will render it ſtill lighter *.

This manure I burnt all times of the year, though ſlower in the winter than ſummer, but always faſteſt in windy weather †.

This, I fancy, may be burnt with bruſh-wood, or furze only; which I apprehend may anſwer better between the coats than coal, as it will keep the clay more open.

ART.

* It is very certain, that burnt clay, uſed as a manure, makes land lighter, by diſuniting the particles, before poſſibly too compact; it therefore ſtands to reaſon, that it is not ſo proper for light porous ſoils: this manure alſo warms and invigorates land, raiſing in it a ſlight fermentation, thereby diſpoſing it to part with its vegetative virtues.

† There cannot be a better or more ſimple method of burning clay than that uſed by our correſpondent: as ſuch we therefore recommend it to our readers.

ARTICLE XVIII.

Of the cheapeſt way of manuring Land.

[From YOUNG's Rural Oeconomy]

THERE are ſo very few farms ſituated on ſoils that are rich enough to need no manuring, that the enquiry what manure is cheapeſt, is certainly one of conſequence. It may be laid down almoſt as a maxim, that there is no farming without manure, and that in plenty too; for the difference is ſo very great between the crops from land that is in good heart, and thoſe from a poor exhauſted ſoil, that the compariſon is almoſt beyond calculation. It ſhould never be forgotten, that the expence of cultivation is the ſame upon the latter as the former. Plowing, harrowing, ſeed, ſowing, rolling, water-furrowing, reaping, harveſting, and carting, when theſe are the ſame upon a field that yields two quarters per acre, as upon another that yields five; what prodigiouſly ſuperior profit muſt ariſe from one, over what is received from the other.

But the neceſſity of thorough manuring may, in part, be gathered from the practice of all good huſbandmen, from the earlieſt account of time. Now, common farmers are in no circumſtance apt to be ſpirited, unleſs the profit has nothing equivocal in it; and we find them, throughout the kingdom, very anxious in procuring manure: however faulty and ſhort-ſighted they may be in ſome reſpects concerning its management, one cannot object to them a falſe idea of its importance; but a too great eagerneſs to gain the benefit of it in a number of ſucceſſive crops. The grand diſpute, in this matter, is the method of procuring manure, the variations of which are extremely great; different almoſt in every ſituation. The preſent point is not therefore to treat of every practice,

which would require a volume, but to ſketch them in general, with a few remarks on the means of ſupplying the capital articles, where they are not to be had.

Marle may be called the prince of manures; both for the degree of fertility which it occaſions, the time it laſts, and the lowneſs of the expence. In thoſe countries where it is moſt profitably uſed, a manuring with marle that laſts good twenty years, coſts from fifty ſhillings to four pounds four ſhillings, which is ſurpriſingly cheap. Suppoſing the price four pounds, it is juſt four ſhillings per acre per annum; which may be called one plowing a year. Now, let the writers on the new Huſbandry conſider this ſtate of the caſe, and reflect whether their ſyſtem of manuring be reaſonable or not. Monſieur Duhamel, or Monſieur du Chateauvieux, I forget which, adviſes the countryman, when he is about to manure his land, to calculate the expence of it, and lay out the ſum in tillage; aſſuring him that the latter will pay him much better than the former. Praiſing one part of good huſbandry in excluſion of another, is the abſurdity of thoſe only who give in to the hypothetical rage of ſyſtem, which is alone ſufficient to darken and perplex the cleareſt minds. Tillage and manure are both abſolutely neceſſary; and that, perhaps, in proportion to each other; for manure, from its vegetative power, makes the ſeeds of weeds to ſprout ſo quickly, that unleſs excellent tillage be given, the ſoil can never be clean. But to think, that one or two plowings annually can poſſibly equal the benefit of marle, is an evident abſurdity.

Clay is, I apprehend, in no reſpect equal to marle, except the duration of the benefit received from it: the degree of fertility it confers, is not comparable to that of marle; but a very good clay may certainly equal, and has been found to exceed an indifferent marle; the expence is the ſame.

Chalk is uſed in many parts of England with a ſucceſs equal to that of any marle under the ſun; but it is very obſervable, that wherever this manure is ſo very excellent, it is univerſal-

ly

y the fat, ſoft, ſoapy kind: quere, therefore, whether that ort and marle be not the ſame thing under different names? The expence of this manure varies like that of marle: It laſts s long.

Lime, I apprehend, is the moſt common and general ma- ure of any that is uſed in England. It is ſo much valued in nany parts of the kingdom, that the farmers think no manage- nent will do without it: But it is very obſervable, that we xperimentally know little of its real utility. The few trials hat have been publiſhed on it, prove rather againſt it. It is aid to be much of that nature which is requiſite for aſſiſting he earth in yielding its fertility, but gives no increaſe.

However, but little is well known concerning it: upon ome ſoils there can be no doubt of its being exceedingly be- eficial, particulary the black moory, peat earths, and boggy ands; and this ſeems to prove the juſtneſs of the above men- ioned obſervation, for theſe ſoils certainly abound much in egetative virtue, but are greatly in want of being enabled to xert it. The expence of liming, in various parts, is ſo ex- remely different, that it is impoſſible even to ſketch any hing like a medium. It riſes from ten ſhillings to ten ounds. Lime no where laſts long; two or three years, and, n many places, only one, are the common duration of the enefit.

Dungs of all kinds are much affected, and with great rea- ſon, by the farmers. The general method is to fodder the raw of the crop in a yard adjoining the barns, where all ſorts re collected together, forming a compoſt, the chief part of which is rotten ſtraw: the benefit every one finds from it is ery great; but in the quantities commonly uſed, viz. from en to thirty loads, the fertility it occaſions does not laſt long; t is a common notion that land ſhould be manured with it very three years; in ſome places four. The expence is difficult to calculate, as it coſts the farmer nothing but car- iage, and perhaps turning over.

In

In the neighbourhood of many cities and towns, farmers buy all ſorts of ſtuff they can get; but this is by no means ſo general as it ought.

It is not my preſent buſineſs to give a complete catalogue of manures, I would only ſketch a few of the principal by way of a guide to direct in the conſideration of ſome that I ſhall propoſe. I therefore paſs over, without mention, a number that are not material in that light.

There are many ſituations that either cannot command marle, chalk, clay, lime; or they are upon ſuch ſoils as they do not agree with; in ſuch places, we generally ſee the farmers confine themſelves to their yard dung, or to the folding their ſheep, if it is the cuſtom of the country: unleſs they are near a town that affords much manure, and it is common to purchaſe it.

Such a ſituation is unfavourable to huſbandry, and a good farmer ought to contrive ſome method or other for remedying ſuch an evil. The grand one which I ſhall in this caſe recommend, is the keeping a great ſtock of cattle, and the purchaſing as much ſtraw and ſtubble as poſſible: And this method of raiſing manure is, I am confident, the cheapeſt that can in many places be practiſed. But the general idea is very contrary, in ſo much that nothing is more common (and indeed the more favourable to ſuch cultivators as have the ſpirit to act differently) than to ſee the farmers ſelling their ſtraw to whoever will buy it. This certainly ſhews a very falſe notion, but I do not think it proves againſt the propoſition: For it is to be obſerved, that few farmers keep half the cattle they ought, and conſequently many of them cannot convert their ſtraw into manure with any profit, conſequently they are obliged to ſell it; and this is ſo often the caſe, that I doubt not but the practice is often thought the reſult of choice, when it is the mere effect of neceſſity. This is one of the many bleſſed effects of their overſtocking themſelves with land; untill they cannot afford to buy cattle, even to convert their own

ſtraw

ſtraw into manure. There cannot be a more fatal error, or one that is more likely to end in a farmer's ruin. It is much like letting their flocks of ſheep out for their neighbours to fold at ſo much per week, which is practiſed in ſome places, and I doubt not but in others they ſell their yard dung.

A quantity of ſtraw turns with a good many cattle to much more dung than many would at firſt imagine. I have found by experiment, that twenty-ſeven head of cattle will convert ſixty five loads of ſtraw and hawlm (beſides what they eat of it) into about three hundred loads of dung.

Hawlm, or wheat ſtubble, ſold for ſix ſhillings or ſeven ſhillings a load, and ſtraw, at an average of all ſorts and ſeaſons, at about twelve ſhillings. Each of the above ſixty-five loads made about three and one half of dung. Horſes well littered yield from twelve to ſeventeen loads of dung per horſe. Five loads of ſtraw, and four of ſtubble, were converted by eighty eight fat hogs into ninety loads of very rotten dung.

But they had not litter enough; they would have made twelve or fifteen loads into manure. As it was, the ſtraw made ten loads for one. I have found in theſe, and other proportions, that the manure is excellent; but that from the hogs much the beſt.

Let us now calculate the expence of manuring in this manner. We muſt calculate, that the cattle in the yard eat none of the ſtraw, becauſe what they eat ſhould be carried to the account of their nouriſhment, and not that of manure: this matter will be ſtated plainly, if we calculate the dung as five to one. The loads of dung, cart loads of forty buſhels, and thoſe of ſtraw, large waggon loads.

One hundred loads of ſtraw will make five hundred of dung: the expences will be as follows.

	l.	s.	d.
100 loads of ſtraw, at 12 *s.* -	60	0	0
Carting 250 loads of ant or mole hills, turf, virgin-earth, * &c. &c. into farm-yard, at 3 *d.* a load digging, or five ſhillings a ſcore, and 7 *s.* a ſcore or day for the team, 12 *s.* a ſcore - - - - -	7	10	0
Mixing 250 loads of earth with 500 of dung: 750 at 1 *d.* - - - - -	3	2	6
Re-carting the compoſt on to the land, and ſpreading it, at 3 *s.* a ſcore or day, and 7 *s.* the team, - - - - -	18	15	0
	£. 89	7	6

This is about 2 *s.* 4 *d.* per load, ſpread on the land: but it it obſervable, I have charged the teams at 1 *s.* per horſe, carts, and man, which is what they may be hyred for in moſt countries: and much beyond what they coſt the farmers.

This circumſtance will near, if not quite, reduce it to 2 *s.* per load; but whether it is called 2 *s.* 2*s.* 2 *d.* or 2 *s.* 4 *d.* is no great matter, for all are ſurpriſingly cheap. Twenty loads per acre of this compoſt come but to L. 2, and the benefit may certainly be calculated at four years duration in great heart. I ſhould chooſe to renew at the end of four years; but the land would, beyond a doubt, be perpetually on the increaſe of fertility. The expence is therefore ten ſhillings per acre per annum.

Marle was found to be 4 *s.* per acre for 20 years duration. At firſt ſight this may appear to be vaſtly cheaper than the dung; but nothing is more true than the contrary. For three years after marling, the benefit is not ſo conſiderable as when the marle is become well mixed with the ſoil. The firſt year it is

* Chalk is excellent for this uſe; and marle better ſtill.

is nothing; the ſecond it begins to come in to play; the third a benefit is found from it, though not equal to the fourth, fifth, &c. and the five laſt years of the twenty the effect is nearly worn out. The ſoil may always be the better for it, but nothing comparable the laſt five years to the preceeding. It holds, therefore, in great vigour twelve years. This circumſtance adds not a little to the 4 *l.* per acre. But farther:

It is to be much queſtioned, whether marle, in its beſt ſtate, any where yeilds an increaſe of product equal to that which ſuch a manuring of dung, as I have mentioned, will occaſion. There are ſoils wherein it would undoubtedly beat the dung, if the latter was tried on the ſame; for inſtance, light ſands. But that compariſon would be uſeleſs; the dung is propoſed as a ſuccedaneum to thoſe manures which cannot be had in any plenty: that is, for the uſe of farmers who have neither marle, chalk, or lime, viz. thoſe in general who occupy loams and clays.

Upon ſuch ſoils five manurings of my dung compoſt, each 20 loads, or 100 in the 20 years, will, I am confident, infinitely exceed the marle on any ſoil whatever. With proper management, of not croſs-cropping, ſuch a manuring will make a loam yield, upon an average of the 20 years, from five to ſix quarters per acre of all ſorts of corn: which marle will never near equal in the beſt 10 years of its 20. Land ſo manured with dung wants no other manuring; but the fineſt marled lands require every now and then a manuring of dung, aſhes, oil-cake, &c. &c. which, if it was added to the firſt expence, would raiſe it much; but the benefit is calculated on the ſuppoſition: indeed I know of no country where the farmers truſt ſolely to their marle. The ſheep-fold is another inſtance of advantage they have, which the dunged ſoil is not ſuppoſed to enjoy, becauſe upon ſuch ſoils the farms are, in general, too ſmall for a fold.

It is from theſe conſiderations, or rather facts, that I venture to pronounce the method here propoſed to be cheaper than

than even marle, which has always been reckoned the cheapeſt of all manures. But there remains another way to calculate it: I before ſuppoſed ſtraw to be bought; but ſtubble is much cheaper, and to be had, in moſt places, in much greater quantities.

	l.	s.	d.
100 loads of ſtubble, at 7 s. -	35	0	0
Carting as before - - -	7	10	0
Mixing ditto - - - -	3	2	6
Re-carting ditto - - -	18	15	0
	£64	7	6

This does not amount to 1 s. 9 d. a load, notwithſtanding the teams are charged at a hiring price. A farmer, I am confident, would manage to reduce this to 1 s. 6 d. But whether he did or not, it is plain the expence of the manuring is vaſtly reduced from the preceeding culculation; and conſequently, the remarks made on that, are much ſtronger with reſpect to this caſe.

I ſhall, in the next place, calculate the expence when the manure is made by fatting of hogs.

	l.	s.	d.
100 loads of ſtubble, as before - -	35	0	
Carting 500 loads of earth to the hog-yard, as before - - - - - -	15	0	
Mixing 1500 loads, at 1 d. - -	6	5	
Re-carting the compoſt on to the land, &c. as before - - - - -	37	10	
	£93	15	

This is exactly 1 *s.* 3 *d.* per load, and the teams charged at the hiring price, as before. It is needleſs to remark, that the expence would, in practice, be much reduced. Twenty loads per acre of this excellent compoſt would coſt no more than 25 *s.* I may fairly venture to pronounce it the cheapeſt of all methods of manuring land.

It is to be remarked, that where young ling, fern, brakes, &c. &c. are to be procured in large quantities, they may be in part ſubſtituted in the room of ſtubble; but the latter deſerves more account for its general plenty; and particularly as the method of converting it to any uſe is unknown, I apprehend, in three fourths of the kingdom; in which parts the farmers would moſt readily ſell it by the acre extremely cheap, an opportunity almoſt invaluable to thoſe who have the ſenſe and penetration to purchaſe all they can, and is, beyond a doubt, the quickeſt, and cheapeſt, and beſt method of improving poor ſoils, and carrying good ones to the higheſt point of fertility.

But for executing plans of this ſort, great ſtocks of cattle are requiſite; hence the truth of the remark I have ſo often made, that without plenty of cattle there can be no good huſbandry. If a man comes to a farm much worn out and damaged by bad management, he ought certainly to convert the chief of it to producing cabbages, trunips, carrots, potatoes, &c. &c. and as faſt as he got any part of it by their means into good heart, to lay down large quantities with artificial graſſes; by which means he will be able to keep great ſtocks of cattle; and this again will enable him profitably to purchaſe ſtraw and ſtubble of his neighbours; a train of management that will inevitably bring all his farm into moſt excellent order and fertility; and when ever he thinks proper to ſow corn, enſure him from one acre, as much as his predeceſſors gained from ten.

The bringing manures from neighbouring cities and towns, is an excellent cuſtom; but, in reſpect of cheapneſs, is not to

be named with that I have juſt ſketched. Two ſhillings and ſixpence a cart load, or five ſhillings a waggon load, are common prices of dung, &c. &c. And for ſoot, aſhes, malt-duſt, woolen-rages, bones, &c. the price is exceedingly high; it is true, the quantity of the latter ſpread on an acre is ſmall; but yet all of them are well known to be dear manures, and, at one mention, plainly more expenſive than thoſe which I have ſketched. Hog dung, clear of all mixture, may be had for 1 *s.* 6 *d* a load, by buying ſtubble, and as good as for 2 *s.* 6 *d* bought in a town, beſides all the expences of carriage.

From the conſiderations, therefore, which have occurred to me, as well as from my own practice, I have the greateſt reaſon to believe, that buying ſtraw or ſtubble to litter great ſtocks of cattle, much the cheapeſt and moſt effectual way of manuring land.

ARTICLE XIX.

On the Utility of a general Survey of the preſent ſtate of Agriculture in every County in this Kingdom.

The Editors of this work entertained very ſanguine hopes, that what was ſaid in their Introduction concerning the advantages to be reaped from a comparative view of the ſtate of agriculture in the different counties of Scotland, [Vol. I. Introd. p. 6. & 25.] would have created a more general correſpondence from the perſons of that profeſſion in the different corners of the country. Some of their friends, convinced of that utility, have taken the hint, and have communicated ſeveral very valuable pieces reſpecting the management in their neighbourhood; for which they return their hearty and ſincere thanks, and will ever be proud of ſuch correſpondents, when they ſhall be pleaſed to honour them in that way. The extent of that correſpondence has not however been ſo general, as, from the great advantages that would

would reſult from it, might have been expected. We are happy however to think, that this has proceeded more from the inattention of thoſe who ſhould communicate that knowledge, than from any belief or conviction, that what we requeſted would contribute nothing to the general good. But that we may not be partial to ourſelves, or our own conceits, we beg leave to lay before our readers the following eſſay, which ſtrongly enforces what we have advanced on this head. The inſtances of miſtaken management in the agriculture in England, from Mr Young's Tour, may convince the farmers of this country, that however much they may be ſatisfied with their own management and oeconomy, or that of their neighbourhood; yet, were the different practices in different corners to be faithfully laid before them, few but would find ſomething to amend or alter.

[From De Re Ruſtica.]

THE *Six Weeks Tour through the ſouthern counties of England and Wales*, is one of the moſt uſeful pieces for improving and promoting agriculture that I have ever met with. It is written by the author of the *Farmer's Letters*. Who he is, is quite immaterial, ſince it is certain he is a man of letters and much reading.

I know not any thing that would contribute more to eſtabliſh in this country a ſound ſyſtem of agriculture, and raiſe the nation to the higheſt pitch of glory, than two or three men of liberal education and knowledge of huſbandry being appointed, at the public expence, to take a ſurvey of the preſent ſtate of agriculture in every county in this kingdom.

They ſhould examine into, and lay before the public, an account of the nature of the ſoil in the different parts of each county; take drawings of the ſeveral implements now in uſe over the kingdom, both the old and thoſe of modern invention; particularly deſcribe the uſe of each, point out their advantages and defects, and of thoſe in particular that are uſed

in

in draught; they ſhould add, what number of horſes or oxen are employed for the purpoſe, and what number appear to be neceſſary. They ſhould alſo give an account of the ſeveral ſorts of grain and plants now cultivated in each county, with the method and courſe in which they are cultivated, remarking what particular grain and plant each county ſeems moſt adapted to; they ſhould likewiſe enquire into the heaths, waſtes, commons, and common fields; alſo into the woods, and what ſtate they are in as to timber. And in regard to the heaths, waſtes, and commons, they ſhould give an account of what each is particularly adapted to, under a ſtate of improvement, with the quantity of acres each contains.

They ſhould alſo examine into the preſent ſtate of the roads, both public and pariſh, point out what new roads, and what improvements and amendments are neceſſary. They ſhould likewiſe particularly examine into the improvements now going forward, under the late acts for the ſeveral incloſures, within the laſt ten or fifteeen years, giving an account of the methods purſued in each county, the expence and manner of laying out the land and incloſing it, with the ſucceſs that has hitherto attended, or ſeems likely to attend ſuch improvements, and the particular local conſequences of theſe ſeveral acts for incloſing.

A work of this kind would be attended with no great difficulty, nor would it require any great length of time: One or two years would compleat it, and perhaps nothing would contribute more to immortalize the reign of GEORGE the Third, than his patronizing this great and valuable undertaking.

If we could once ſee a well-adapted, ſound ſyſtem of huſbandry practiſed through this kingdom, not only in the preſent cultivated, but alſo now uncultivated lands; we need no longer ſtand in fear of any of our neighbours: on the contrary, we ſhould certainly become the greateſt people in Europe, and the granary to all.

France

France had once a minister who would soon have catched my flying thoughts. I would *We* had such an one at this time! That great man turned his chief attention to agriculture: he looked upon it, to the nation, as the foundation of its power; the support of its grandeur, and the true source of the people's happiness.

He stated the value of the provinces in proportion to the plenty which each yielded, and he preferred such riches to conquest, which creates resentment and jealousy. "Plenty, "said he, renders neighbouring nations dependent on us, "since we can refuse or consent to supply their wants. The "productions of the earth cannot be carried off, but to the "profit of the owner, in the way of trade; but arts and manu- "factures may, with the artist and manufacturer, be carried "to any other country in the world."

The knowledge of the œconomical government of a king- dom was, in the opinion of this great man, the true science of a statesman, since it gave birth to, and increased the wealth of the nation. "The inattention of the people, said he, in not "cultivating their waste lands, must be got the better of; but "it must be done by precept, and their concurrence must be "gained by encouragements." The truly great master of this excellent minister seconded all his wise extensive views, and, in the spirit of true patriotism, he estimated the men of landed estates, who *sauntered* about his court, to the detriment of their own affairs, and the manifest hurt of their country.

However, not to wander too far for matter to illustrate my subject, I shall now, in some respect, shew the necessity of such an examination as I have recommended, into our present system of husbandry through the kingdom, by laying before you, from the *Six Weeks Tour*, the author's account of plowing, from the east to the west side of the island.

"The variations in the manner of tillage were extremely "great, and form an instance of as mistaken management as

"any

" any I met with. This will appear very evident, from the
" following table of ſoils, and quantity plowed in a day.

" Improved parts of Northfolk.

" Light turnip land:

" 2 Horſes,

" 2 Acres.

" Acroſs Suffolk and to Braintree in Eſſex.

" Light, loamy, and ſome heavy bean land:

" 2 Horſes,

" 1 Acre.

" At Lord Clare's in Eſſex.

" Loam too heavy for turnips:

" 2 Oxen,

" 1 Acre.

" Between Braintree and Chelmsford.

" Mixed ſoils, both light and heavy; turnips and beans:

" 3 Horſes, ſometimes four,

" 1 Acre.

" Between Acton in Uxbridge, Middleſex.

" Both light and heavy; turnip and bean-land:

" 4 Horſes in a line,

" 1 Acre.

" Around Wycomb, in Buckinghamſhire.

" Light ſoil; bears good turnips:

" Five Horſes, often ſix,

" From ½ to 1 acre.

" About Stock Church, in Oxfordſhire.

" Chalky ſoil:

" 6 Horſes,

" 1 Acre.

" Near Sherborn, on Cotſwould-hills, Glouceſterſhire.

" Light, but chalky and poor:

" 4 Horſes,

" 1 Acre.

" Fro

" From North Leach, through Glouceſterſhire, Monmouth-
" ſhire, and Glamorganſhire.
" Light and middling turnip-land, &c.
" Eight oxen; never leſs than ſix; or four, and
" two horſes.
" From ½ to 1 acre.
" Between the Deviſes and Saliſbury.
" Light and middling; great quantities of turnips:
" 4 Horſes, never leſs than three,
" Scarce one acre.
" In the neighbourhood of Saliſbury.
" Various ſoils, but in general light:
" 3 and 5 Horſes,
" 1 Acre.
" Through Hampſhire.
" Light dry ſoil in general:
" 4 Horſes,
" 1 Acre.
" Between Guilford and Cobham in Surry.
" Much ſand; and light loam:
" 4 Horſes, and often more,
" 4, 6, and 8 Oxen,
" 1½ Acre, light ſoil,
" 1 Acre heavy.
" About Ilford, Eſſex.
" Gravel,
" 2 Horſes,
" 1 Acre."

It is certainly very evident, from this account, that a great number of cattle are kept to no purpoſe, and that the keeping of them is not only a private, but a public misfortune; ſince the land employed to maintain them might be applied much more profitably to the farmer and the nation. This matter therefore cries aloud for public examination, and if the Lon-

don

don Society was on that ſolid, united footing, which many gentlemen wiſh it was, I ſhould be tempted to lay before them a hint, recommending the procuring, not a model, but an actual plough; I mean every different plough uſed through England *: When this was done, I would have a meeting called of mechanical gentlemen and actual mechanics, when, it is very poſſible, a plough might ſoon be produced, which might be yet more adapted to anſwer the purpoſes required of a plough than any now in uſe, the requiſites of a plough being eaſy entrance, ſteadineſs, compleat ſubverſion, and leaſt reſiſtance or draught.

* The beſt known plough at preſent is the Rotherham, or patent plough. This plough, with a pair of horſes, without a driver, the reins anſwering the purpoſe, will, with eaſe to the horſes, plow an acre a day, in all arable land, light or ſtiff: and we have great pleaſure in being able, upon enquiry, to inform our readers in the neighbourhood of London, that this plough is made, in a compleat manner by, K. Edwards, wheel-wright, near the Plough, at Clapham, in Surry.

THE

SCOTS FARMER,

JANUARY 1774.

ARTICLE XX.

Of the Culture of Barley—Of the Culture of Oats:

[Dickſon's Agriculture Vol. II.]

BARLEY is the grain next in value to wheat. There are three different kinds of it uſed in Scotland: The common barley, the Lincolnſhire barley, and the Highland barley, commonly called Rough Bear. There is another kind lately introduced, called the Thanet barley. This laſt is very little different from the common barley in appearance; the ſtalk is longer, and it is not ſo eaſily lodged. This makes it very proper to be uſed when graſs-ſeeds are ſown; for the graſs is often damaged by the lodging of the corn. Neither is the Lincolnſhire barley much different in appearance from the common barley. The grain in the ear is ſet cloſer together, and more horizontal than the common barley. It is likewiſe longer in the ſtalk, a hardier plant, and much longer in ripening. The rough bear is different from the others. It is ſooner ready than the common barley; and, inſtead of two rows of grain in the ear as the others have, it has ſix, the grain very wide ſet. It is uncertain whether theſe are originally of a different ſpecies, or whether it is the difference of climate, ſoil, and culture, that has made them different. It is certain, that when rough bear is brought to a part of the country where barley is commonly ſown, after being ſown for a few years it is turned into barley. But this is no evidence

of its being originally the ſame ſpecies, as appears from what was obſerved of the different kinds of wheat. It is probable, that the Lincolnſhire barley, and common barley, are the ſame ſpecies, as it is obſerved that the oftner that the Lincolnſhire barley is ſown in this country, it approaches nearer to the common barley in the time of its ripening.

Theſe different kinds of barley are ſown at different ſeaſons. The Lincolnſhire barley may be ſown any time during the winter, or in the ſpring: The common barley and Thanet may be ſown in April, or in the beginning of May, or even later; and the rough bear may be ſown in May, or even the beginning of June.

The preciſe time of ſowing ſhould be determined by the weather and ſituation of the land. If the ſeaſon is favourable, the land in a proper ſituation, free from weeds, and not too wet, Lincolnſhire barley may be ſown in February. But if the ſeaſon is unfavourable, and the land wet, it ought not to be ſown till the ſeaſon is farther advanced: For either plowing, or harrowing land when wet, is very hurtful, and endangers the crop.

If the ſeaſon is favourable, and the land free from weeds, the other kinds of barley may be ſown ſooner in the ſeaſon than the time mentioned; but if the ſeaſon is unfavourable, or the land infeſted with weeds, the ſowing theſe ſhould be delayed as long as poſſible. When land is infeſted with weeds of any kind, the farther that the ſeaſon is advanced before the barley is ſown, the leſs hurt the weeds do to the crop. In proportion as the ſowing the ſeed is late, the greater number of weeds ſpring before the ſeed-furrow, by which they are deſtroyed, and the weeds that grow afterwards are the farther removed from their proper ſeaſon, and are thereby prevented from becoming vigorous. The further too that the ſeaſon is advanced, the ſeed ſprings up the ſooner, and thereby the more effectually gets the better of its adverſaries and the land being drier when plowed, the greater number of the

roots

roots of the quickening graſs may be got out, or deſtroyed.

When barley is ſown in winter, or early in ſpring, the land may be plowed ſome time before; but if it is ſown late in ſpring, or in ſummer, it ought to be ſown immediately after the plough. In winter, or early in ſpring, land is not in danger of becoming too dry, and therefore there is no need to be careful to preſerve the ſap to make the ſeed vegetate. But in ſummer, land is apt to become too dry for the purpoſes of vegetation; and therefore the method of plowing and ſowing at that ſeaſon, that ſerves beſt to preſerve the ſap, is the moſt proper. Either plowing in the ſeed, or ſowing the land as ſoon as it is plowed, ſerve this purpoſe beſt. It is evident that plowing in dry weather makes the land drier; for the dry ſurface is turned down, and a moiſt ſurface expoſed, which ſoon becomes dry likewiſe; beſides, the land is rendered opener, and more uneven, and thereby it is more expoſed to the influence of the winds, and more eaſily penetrated by them. Hence then, if land is allowed to remain for ſome time after it is plowed before it can be ſown, it dries very faſt in that time; and the harrowing, though it puts the land in a ſituation to retain the ſap, yet is a means of exhauſting it while the work is performing, and for ſome ſhort time after; for it changes the ſurface, turns down a dry ſurface, and turns up one that is moiſt. But if the land is harrowed immediately after plowing, it retains the ſap, and very little is loſt in the harrowing; for though the ſurface is changed, yet the one turned down, and the other brought up, are almoſt of the ſame kind, as the ſurface turned up by the plough has not had time to dry.

When the ſowing of the barley is delayed till it is late in the ſeaſon, ſometimes the land, notwithſtanding all the care that can be taken, becomes ſo dry that the ſeed has not ſap enough to make it vegetate. The farmer, therefore, ſhould endeavour to have all the ſeed ſown before the ſeaſon is too far

far advanced: And in order to this, he ſhould manage his matters in ſuch a manner, as to have ſome of the breaks, deſigned for barley, in ſuch a ſituation as to be ſown ſafely with the Lincolnſhire barley, or early in the ſeaſon with the common barley.

The quantity of barley ſown upon an acre is from two to four firlots. The ſituation of the land, as has already been obſerved in the caſe of wheat, ſhould determine the preciſe quantity. When the land is clean and rich, two firlots are ſufficient; but when the land is infeſted with weeds, a larger quantity is neceſſary.

Barley is not a good forager: it has tender roots and is not very able to ſearch for its food: Hence it becomes neceſſary to bring the land, upon which it is to be ſown, into very good tilth: and to enlarge the vegetable paſture, either by manures or frequent plowings.

Barley is frequently ſown upon land that has been fallowed, and frequently upon land after a crop of peaſe or wheat. In ſome places it is ſown after a crop of oats; and ſometimes it is repeated for two or three years ſucceſſively upon the ſame land.

When barley is to be ſown upon fallow, the land ſtiff, and not much troubled with annual weeds, it ſhould be dreſſed in the month of November, as if for wheat; that ſo Lincolnſhire barley may be ſown if the winter is favourable, or ſpring barley upon the winter-furrow, if the ſeaſon proves unfavourable. It is proper in every kind of land to dreſs the fallow in this manner; but if the land is naturally rich, or the ſeaſon mild and open, it is neceſſary to give it another plowing before the ſeed is ſown.

When barley is to be ſown after wheat, peaſe, or oats, the land ſhould be plowed as ſoon after harveſt as poſſible, and laid up in ſuch a manner, as beſt to be expoſed to the influence of the air and froſt, and as beſt to be ſecured againſt receiving damage from rain.

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In ſome places they rib the barley-land at this ſeaſon, as the beſt method to anſwer theſe purpoſes. [Vol. I. p. 120, 430, 433.] But ribbing, though it may anſwer ſome of theſe purpoſes, yet it ſtirs but a ſmall quantity of the ſoil; and therefore it is better to gather it into narrow ridges of four or ſix furrows each, and to make drains in all places neceſſary for conveying away the water. By theſe means the winter rain finds its way eaſily off, the land itſelf receives the greateſt benefit from the air and froſt, and it is the ſooner in the ſpring in a proper condition for receiving another plowing. This firſt plowing which the barley-land receives, needs not be very deep, but ought to beas broad as the plough can do it, ſo as to be clean plowed. For as the deſign of this plowing is to cover the ſtubble, increaſe the vegetable food, and keep the land dry, the more uneven that the ſurface is made, and the broader that the land is plowed, it is the better expoſed to the influence of the air; and the water finds its way off the more eaſily, [Vol. I. p. 334.]

If it is propoſed to dung the barley-land, the dung may very conveniently be laid on during the winter froſt, and plowed in as ſoon as the land is in a proper condition. Though there ſhould be no froſt to prevent plowing, as is ſometimes the caſe; yet, if carts can go upon the land without danger, it is not improper to lay on the dung before the ſecond plowing, or ſteering furrow, as it is commonly called. When the laying on of the dung is delayed till immediately before the laſt plowing, or ſeed-furrow, the land, if it is ſtiff in its nature, is in danger of being battered ſo as to riſe in large clods when plowed; by this means the drought, common at that ſeaſon, has eaſy acceſs, and prevents the ſeed from ſtriking root. Even though the land ſhould be light, yet, if the dung to be laid on is not well rotten, it is apt to occaſion ſuch an hollowneſs or openneſs in the land, as to render the crop eaſily damaged by drought: But when the dung is laid on before ſteering, no ſuch inconveniencies follow: For, though the land riſe in clods when plowed, yet, at the ſeaſon of this

plowing,

plowing, there being ſufficient ſap to make the dung operate, a fermentation is raiſed; and, in aſhort time, the land is made ſoft and mellow, and in a proper condition for being plowed, when it gets the ſeed-furrow. Though the dung may be rough when laid on, yet it is mixed, and made to incorporate with the ſoil by the two plowings, in ſuch a manner as to give no particular advantage to the drought.

In ſteering, the plowing ſhould be as deep as the plow can go, and the ſoil allows. Deep plowing is always proper in deep ſoil; and, in giving the barley-land the ſteering-furrow, this can be done moſt conveniently, as the land is open by reaſon of the former plowing, and as it is always ſufficiently moiſt at the ſeaſon of giving this plowing. By deep plowing at this ſeaſon, the mold, expoſed to the air through the winter, is not buried ſo as not to be turned up by the ſhallow plowing given at the ſeed furrow, as perhaps may be imagined: For, in the ordinary plowing of this country, the earth of the furrow is only turned half over, ſo that when the barley-land is plowed deep at the ſteering-furrow, and this reverſed by a ſhallow plowing at the ſeed-furrow, part of the earth that has lain expoſed to the air through the winter, and part of the new ſoil turned up at the ſteering-furrow, are mixed together for the paſture and nouriſhment of the crop. In ſteering, the furrows ſhould not be taken off ſo broad as at the former plowing; on the contrary, the narrower they are the better. The chief deſign of ſteering is to enlarge the vegetable paſture, to encourage the growth of ſeed-weeds, and take out root-weeds. Now the deeper that land is plowed, theſe purpoſes are the better anſwered. If the land is ſo dry as to allow it, croſs plowing is very proper at this ſeaſon. By it the ſoil is better broke, and the harrows have greater influence in pulling out the roots. But, if this ſort of plowing is thought dangerous, on account of the wetneſs of the land, two or three of the narrow ridges, made at the former plowing, may be turned into one; or, if the ridges are of an ordinary breadth, they

they may be caſten or cloven. On no acount they ſhould be gathered, as thereby they would be raiſed too high, and in an improper ſituation for the kind of plowing which the land ſhould receive at the ſeed furrow.

After ſteering, the land ſhould be well harrowed. This makes the weeds ſpring, and retains the ſap; and, if the land is tolerably dry, takes out the roots of the quickening-graſs, When the land is in no great danger of loſing the ſap, it may lye for ſome time after it is plowed before it be harrowed; for by this a greater number of weeds are deſtroyed: But, if it is in danger of loſing the ſap, by which the vegetation of the weeds is prevented, it ſhould be harrowed immediately after it is plowed; for by this the leſs quantity of ſap is loſt.

Though frequent plowings in the general are beneficial, yet it is certain that plowing, when the land is over-wet, is deſtructive. When the ſpring is wet, as it ſometimes happens to be, the barley-land in many places is not in a proper condition for being plowed. In this caſe the ſteering furrow muſt be omitted, and the land, as ſoon as it is in a proper ſituation, ſhould get the ſeed-furrow. When barley-land is ſteered wet, it is in a worſe condition when it gets the ſeed-furrow, than if the ſteering-furrow had been omitted; and it is ſo whether the after-ſeaſon is wet or dry. If the ſeaſon is wet, the land receives and retains more of the water than if it had remained unplowed. When land has remained untouched during the winter, though it may have been plowed immediately before, yet it acquires a degree of firmneſs that enables it to reſiſt the rain, and make the water run off. But land newly plowed, eſpecially if it is turned over with whole furrow, as is the caſe with almoſt all wet land, reſiſts no water, it receives it all in the openings betwixt the whole furrows. If the ſeaſon is dry, the wet plowed land dries too quickly, and thereby becomes ſo hard that it is almoſt impoſſible, for ſome time, to break it into a proper mold: Whereas the unplowed land, though equally wet, yet not being ſo much ex-

poſed

poſed to the influence of the winds and ſun, does not dry ſo quickly, and hence does not become ſo hard. Suppoſe that the ſeaſon is the moſt favourable, in the general dry, but the drought not violent, yet the land that has been plowed wet, ſo much as it dries, muſt dry faſter than the unplowed land, and conſequently be ſo much the harder.

When barley is to be ſown a ſecond time upon the ſame land, without any other crop interveening, and the land, before the firſt ſowing, has got a ſufficient number of plowings, two is ſufficient for it the ſecond time. The ſituation of the land muſt determine at what time the firſt plowing ſhould be given, whether immediately after the harveſt or in the ſpring. When land is ſo ſituated, as to make it uncertain, whether, even in a tolerable ſeaſon, it ſhall be in a proper condition for being plowed in the ſpring, or when it is clean, and free from weeds, then it ought certainly to be plowed before winter; for this reaſon, that when land is plowed, it receives more benefit from the air than when it lies unplowed. But when it is in no danger of being in an improper ſituation for being plowed in the ſpring, and, at the ſame time, is infeſted with weeds, then the plowing ſhould be delayed till that ſeaſon. Nothing can be done after the autumn-plowing to deſtroy weeds, and when land lies ſo long untouched, as from the autumn to the time of making the barley-ſeed in the ſpring, the growth of the quickening-graſs is greatly encouraged. But when land is plowed in the ſpring, the ſeed-weeds are encouraged to vegetate, and the roots of the quickening-graſs may be pulled out. When the barley-land is to receive only two plowings, and has got the firſt in the autumn, it is proper to harrow it in the ſteering time. This in ſome meaſure anſwers the deſign of plowing in the deſtruction of weeds.

Though the laying on of dung, before the ſteering furrow, has been recommended, yet when the dung is compleatly rotten, and the land ſoft and light, the delaying this, till immediately before the ſeed-furrow, does rather better. The

going

ing of the carts upon ſuch land is an advantage; it akes it firm, and riſe with a clod in the plowing. This, it is he, leſſens the vegetable paſture for ſome time, but then it events the weeds from ſpringing along with the barley, and ves the barley ſo much the advantage, as to prevent it from ceiving any damage from them for that ſeaſon; and the ve- table paſture, leſſened by the going of the carts, is ſoon re- ored by the operation of the dung.

When land is ſtiff, and the laying on of dung has been de- yed till after the ſteering-furrow, or when the land has been wet as not to allow ſteering, the dung ſhould be allowed to ſome time ſpread on the land before it is plowed in: For ough ſome of the virtues of the dung may thereby be loſt, t, by its lying upon the land, it not only makes it retain the , but alſo makes it ſoft and mellow on the ſurface, and in a ore proper condition for receiving the ſeed furrow.

The ſeed-furrows needs not be very deep; for the roots of e barley go down but a ſhort way; but it ſhould be very rrow, ſo as the land may be as completely reduced as poſ- le; for the more completely that the land is reduced, the ger is the vegetable paſture, and the more effectually is the retained.

As our ſummers in Scotland are ſometimes very rainy, when nd is in danger of being damaged by water, after the barley own, it ſhould be water-furrowed, and dreſſed up in the ne manner as the wheat-land.

Of the culture of Oats.

The Oat is a very hardy plant and a good forager. By the ength of its roots it procures its food, where many other ants ſtarve. Hence the practice of giving leſs culture to e oats than to any other grain.

There are three kinds of oats uſed in Scotland, the white, e black, and the grey. The white is the moſt common, and

uſed in all the low countries. The black is reckoned the hardieſt plant of the two, and is uſed in the cold hilly countries; and the grey is, in ſome parts of the country, ſown with ſucceſs upon light gravel or ſand. The white is divided into two particular kinds, called cold ſeed and hot ſeed. There is ſcarcely any difference in appearance betwixt theſe. The hot ſeed ripens eight or ten days before the other. It is commonly thought that theſe were of the ſame kind originally; but that the ſeed that has been often ſown upon warm ſoil, and by it having been ſooner brought to perfection, has at length had its nature changed, and become like the plant natural to ſuch a ſoil. This we may eaſily believe, as we find the nature of animals, as well as other vegetables, undergoing greater changes than this, from habit. The place of the country, the moſt remarkable for this kind of oats is a light warm ſoil, and when they are taken to colder ſoils, and often ſown, it is found that they degenerate, and are longer in ripening than at firſt.

Experience muſt determine, which of theſe is to be choſen for ſeed. Though the oat is a hardy plant, and does not eaſily degenerate, yet the changing of ſeed is univerſally by the farmers reckoned a good practice. This change, it is natural to ſuppoſe, ſhould be made from warm ſoil to cold, and from cold to warm. When hot ſeed is brought to a cold ſoil, the ſowing may be delayed for fourteen or fifteen days, which may be of very great importance, as, from the nature of the ſeaſon, land in bad order for being ſown with cold ſeed, may be in a very proper condition for being ſown with hot ſeed. When cold ſeed is brought to a warm ſoil, a hardy plant is brought into a good climate and paſture, and it thrives accordingly.

Oats are often ſown upon graſs ground newly broken up, or, which is the ſame thing, upon lee once plowed: Often they are ſown after barley, ſometimes after wheat, ſometimes upon fallow, and ſometimes are repeated for ſeveral years ſucceſſively upon the ſame land.

In plowing lee for oats, when the land is ſoft and mellow, the plough ſhould go as ſhallow as poſſible, and ſet the ear of the furrow as exactly as poſſible upon its edges. For the thinn

thinner that the turf or ſward is taken off by the plough, an the more upright that it is ſet, the harrows make the greater impreſſion, and tear it the more eaſily in pieces. If the ridges are ſteep, or high raiſed in the crowns, they ought to be cloven down; for if they are gathered or caſten, it is improper to harrow acroſs, leſt the harrows turn back the turf inſtead of tearing it; and harrowing acroſs is the moſt proper way to break the turf and reduce the land. But when the land is ſtiff, or the turf very tough, as it commonly is on poor or wet land, it is neceſſary to plow deeper, and to turn the turf fully over, that ſo the harrows may raiſe a kind of mold upon its back to fill up the hollows betwixt turfs, and to nouriſh the ſeed.

When oats are to be ſown upon lee, the land ſhould be plowed early in winter, that ſo it may receive the greater benefit from the air and froſt, to deſtroy the graſs-roots and to mellow the ſoil. When the lee is to be trenched, it ought likewiſe to be plowed early, that ſo the turf may have the longer time to rot before the ſeed is ſown.

It is very common to lime the lee-ground that is intended for oats. This is a very good cuſtom, for lime promotes the corrupting of the graſs-roots, by which means the land is the ſooner reduced.

When lee is limed, it is common to ſpread the lime upon the ſward, ſometime before the land is plowed. This is likewiſe a good cuſtom; for the lime incorporating with the ſward, is not ſo apt to fall to the bottom of the furrows, and penetrate down through the ſoil, as when it is plowed in, lying looſe upon the ſurface.

In the ordinary ſchemes of management upon rich land, oats are ſown after barley, whether the barley has been ſown upon fallow, or after wheat, or after peaſe, and the land is plowed as ſoon as the wheat-ſeed is made, and the barley-land has got the firſt furrow. The ſtiff land, and the land in danger of being damaged by wetneſs, ſhould be firſt plowed, the

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one to have the benefit of the winter froſt to mellow it, and the other to be put out of danger. It may be proper ſometimes to plow ſome pieces of this kind before the barley-land gets the firſt furrow; but this muſt always be left to the judgment of the farmer, as many other things muſt be, about which it is not poſſible to give poſitive directions. It is likewiſe an advantage to light and dry land to be plowed early in the ſeaſon, as this makes the ſtubble rot ſooner, and expoſes the ſoil to receive greater benefit from the air. But as theſe advantages that this kind of ſoil receives from being early plowed, are not ſo important as the advantages that ſtiff and wet ſoil receive from this, the plowing of light and dry land may therefore be more ſafely delayed till the ſpring.

In wet ſtiff lands when wheat is ſown upon the fallow, and the fallow made very clean and well reduced, ſome farmers ſow oats after the wheat. At the ſeaſon of plowing the oat land, they find the land, that has carried a crop of wheat, much drier than the land that has carried a crop of barley; and upon the dry plowing of the oat-land in ſome meaſure depends the goodneſs of the crop. The nature of the culture and crop makes land after a crop of wheat, much firmer than after a crop of barley, and the firmneſs of the land, reſiſts the rain and makes it run off. This practice, though not very common and generally condemned, may however be ſucceſsful in lands in the ſituation mentioned.

On ſome barren lands that are at a diſtance from all foreign manures, nothing is ſown but oats, and theſe are repeated ſeveral years ſucceſſively. When this is done, and oats ſown after oats, the land is managed in the ſame manner, as when they are ſown after barley.

I obſerved, that oats are ſometimes ſown upon fallow. In the hilly countries, they often fallow the land that has been in lee for ſome years, and they find that this practice does better than giving it only one plowing in the winter before the ſeed is ſown. In the low countries, even where the land

is

is tolerably good, this practice of fallowing for oats is found to ſucceed very well. Inſtead of cropping land till it is quite wore out, and then letting it lye for graſs, as was the general way of managing out-field land in Scotland, ſome farmers after bringing their out-field into tolerable order, take but a few crops, and then give it a fallowing. This ſometimes occaſions more fallow than they have dung for; and without dung, except upon very rich land, neither a good crop of wheat or barley, is to be expected. For which reaſon ſome farmers have been led to try oats upon the fallow without dung, which, generally ſpeaking, ſucceeds very well. But then, as the oat is a good forager, it may be expected, that, when aſſiſted by a fallow, it will ſearch the ſoil very ſeverely; and therefore when this is done, graſs-ſeeds ſhould be ſown along with the oats.

The fallow for oats ſhould be managed through the ſummer in the ſame manner and with the ſame care as if for barley or wheat. Before winter it ſhould get the laſt furrow and be laid up in proper ridges, ſo as to be kept dry during the winter, and to be proper for being ſown in the ſpring.

Oats may be ſown in any of the winter months, or in the month of March. Some perſons have ſown them ſo early as the beginning of November, and have had good crops. But, if the land can be laid up in ſuch a manner as to be in a proper condition for being ſown in the month of March, it is better to delay the ſowing till that time. When land lyes ſmooth all winter, and is not plowed in the ſpring, root-weeds being ſo long undiſturbed are greatly increaſed, and the land itſelf receives but little benefit from the air and winds. Whenever therefore the ſowing of ſeed may be ſafely delayed till the ſpring, it ought not to be ſown in winter; for if it is, neither ſo good a crop is to be expected, nor the land in ſo good a condition when the crop is taken off.

Of oats there are commonly ſown upon an acre from four to five firlots. The ſituation of the land, as has been obſerved,

when

when it is intended for wheat or barley, muſt determine the preciſe quantity

It is the general opinion that oats ſhould get a dry bed. This opinion is well founded. There is no want of ſap at the ſeaſon when the oats are ſown, and provided there is as much ſap as to make the ſeed vegetate, the drier that the land is when the ſeed is ſown, as has already been obſerved, it is in a ſituation ſo much the more proper. Though a certain quantity of water is neceſſary for carrying on the proceſs of vegetation in every plant, yet when more of this is applied than is neceſſary, the plant ſuffers, and does not arrive at ſuch perfection as otherwiſe it would do. Thus we find, that in wet ſummers the grain is never ſo good as in dry.

As there are often heavy rains after the ſowing of the oats, it is neceſſary to water-furrow the land carefully, and otherwiſe manage it as if ſown with wheat before the winter.

ARTICLE XXI.

THE FARMER's KALENDAR

FEBRUARY.

BEANS.

IN this month, begin to ſow your bean crop, and, if your ſoil and the ſeaſon agree, finiſh if you can; for later ſown crops will not ſucceed ſo well. The land ought to have been plowed into the three-foot ridge, and well water-furrowed the autumn before; by which means your only object now will be the ſeed earth: ſo that the firſt dry ſeaſon may be taken for ſowing. To get the bean crop in the land in February is an object of much conſequence, if the ſoil is dry enough.

As to the methods of ſowing, there are many. Some farmers ſow the beans over the land, and plough them in; others plough firſt, and harrow in the ſeed; and theſe both on ridge and flat work. The beſt way of ſowing is either to half plough the ridges, and ſowing broad-caſt, afterwards finiſh: or to ſprain them by hand before the plough, ſo that they may riſe in rows on the tops of the ridges. In the latter way, they are in ſingle rows; but, in the former, double. In the following ſummer, the ſingle rows are plowed between, in the horſe-hoeing manner, and the double ones hand-hoed: both are common huſbandry in ſeveral parts of the kingdom. But I ſhall recommend, in preference to them, uſing a drill plough at leaſt for ſhedding the ſeed, as it executes that work with much greater accuracy, than any hand in the world can do. Light drills may be had to wheel along the ground, like a wheel-barrow. The uſe of ſuch an inſtrument will ſave much money, at the ſame time that it performs the work much better than any other method. Beſides theſe methods of ſowing, in ſome parts they dibble in with an iron, which makes three, four, or ſix holes at once, by which means, a buſhel does

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for an acre of land, whereas if they are ſown it requires twice or thrice that quantity. A Farmer, that has land proper for beans, ſhould, on no account, avoid giving a particular attention to the crop; for it will prove one of his ſureſt funds of profit. By means of beans, he may be able to baniſh the unprofitable cuſtom of fallowing; for a crop of beans, riſing in ſingle rows on three feet ridges, or double rows at one foot on four feet ridges, gives ſo good an opportunity for plowing the intervals, and alſo admits hand-hoeing the rows, that the land may be cleaned as well as any fallow, and the crop ſucceeded by corn: but, if the ſoil is in ſuch terrible order, that this culture is inſufficient to clean it, then let a ſecond crop of drilled beans ſucceed, which will be very profitable huſbandry, and cannot fail of bringing it into garden order. Whenever beans are cultivated with this view of ſubſtituting them in the room of a fallow, let the farmer abſolutely determine on drilling them, ſo as to admit the plough between the rows; for no hand work will clean and pulverize the land ſufficiently for this purpoſe, at leaſt without an expence too great for the object. If the ſpirited huſbandman calculates the expence of ſummer fallow, and alſo the account of a drilled bean crop, he will find the neceſſity of this culture. Beans do very well on loams, and on lighter ones than commonly imagined; but on light gravels, ſands, &c. more profitable crops may be ſubſtituted. Let the farmer remember the general maxim in his tillage for beans this month, never to allow his ploughs to ſtir while the land is wet: if his horſes poach at all, or his ploughs do not go clean through the land, he will loſe, or at leaſt greatly damage his crop. Two buſhels of ſeed *per* acre ſown, and ſix pecks drilled in equally-diſtant rows, three feet aſunder, are ſufficient quantities.*

Peaſe.

† The bean and peaſe firlot is nearly the ſame with the Engliſh Wincheſter buſhel, by the table of proportions, Vol. 1. p.653. But the farmer muſt advert that the Engliſh acre is leſs than the Scots by about a fifth part, the Engliſh being to the Scots nearly as 435 to 547.

Peaſe.

This is alſo the ſeaſon for ſowing the hardy ſorts of peaſe. The land ſhould have been plowed in autumn, and again at ſowing; if the ſoil is light and porous, turn them in by the plough; but on other lands it has been found more advantageous to plow firſt, and then harrow them in. A farmer, deſirous of keeping his land always in good and clean order, ſhould, in the arrangement of his crops, take great care not to be too free with wheat, barley, and oats, which are all exhauſting plants: he ſhould ſow beans and peaſe enough, becauſe they are enriching ones, and admit hand-hoeing to kill the weeds. In thoſe fields in which the common huſbandmen ſow oats or barley, after wheat, or each other, let the good cultivator ſubſtitute peaſe or beans, or ſome other enriching crop, which will pay him better than corn, under ſuch circumſtances, and at the ſame time keep his land clean.

I muſt in general remark, on the culture of peaſe, that the farmers are too apt to ſow this pulſe when the land will yield nothing elſe. They have a proverb among them, which ſignifies, that the ſeaſon does as much for peaſe as good huſbandry; and they from thence take care, that good crops ſhall be owing to ſeaſon alone. Hence ariſes the general idea of peaſe being the moſt uncertain crop of all others. All this is owing merely to their being ſcarcely ever ſown on land that is in good order. Let the good huſbandman lay it down as a maxim, that he ſhould ſow no crop on land that is not in good order: he ſhould never ſow oats, peaſe, or beans, on land, that is not in order for barley—not reſpecting the fine tilth at the time of ſowing, but the ſoil's being in good heart, and clear of weeds. But I would not here be underſtood to rank all theſe crops together; becauſe beans and peaſe will admit of cleaning while they grow, whereas corn will not, to any profit. So that, if a farmer comes to a field, which his predeceſſor has filled with weeds, a horſe-hoed crop of beans will be expedi-

ent, when a barley crop would be utterly improper: and after land has yielded one crop of barley, certainly another ſhould not be ſown, but one of pulſe ſubſtituted. If theſe ideas are well executed, the peaſe and beans, in every courſe, will find the land in heart enough for barley, the ſoil will always be clean, and the crop good. Peaſe, when managed in a ſpirited manner, will not have the reputation of being an uncertain crop, which character, I am perſuaded, has been owing to the ſlovenly conduct of bad farmers.

Black Oats †.

This month is the proper ſeaſon for ſowing black oats: the land ſhould be plowed firſt, and the ſeed harrowed in. Four buſhels per acre are a proper proportion of ſeed, in rich ſoils; but five or ſix do better on poorer ones. They ſuit beſt on turf land plowed up in the winter, and left till this time for harrowing in, which is a profitable huſbandry, as it finds employment for the ploughs throughout winter. The farmers uſually ſow them after other crops of corn, but that practice is always to be condemned: they likewiſe plow but once for them; on the contrary, I ſuppoſe the land to have been plowed in the preceeding autumn. They follow beans or peaſe properly, or any ameliorating crop of roots, &c. Suppoſing the land too wet to plow, they cannot be ſown this month; but, if your ſoil and the ſeaſon will allow, never delay getting them into the ground: for early ſowings of all hardy crops, when the land is dry enough, are of great importance, and many times more than ſufficient to balance other very expenſive circumſtances.

Barley.

It is now a proper time to examine ſuch of your turnip fields as are finiſhed, whether drawn or fed on the land. If they will break up in a pretty crumbling, mellow ſtate, it will be adviſeable

† See page 121 of this Volume.

dviſeable to leave them till the next month, and then plow nd ſow; but, if you find that the land will not, with one lowing, be fine enough for this grain, then effectual care hould be taken not to loſe a dry ſeaſon for giving it the firſt illage this month, otherwiſe it will be ſown too late.

Carrots.

This crop is of vaſt importance to the farmers, who have ſpirit enough to cultivate it. It is not merely book-huſbandry, but actually common in ſome parts of this kingdom. March is the proper ſeaſon for ſowing it; but, on ſome ſoils, part of the preparation muſt be made this month. I ſuppoſe the land plowed as deep as poſſible in October: if, on examining it, there is any reaſon to expect it will be deficient in fineneſs on ſowing, let it receive a common plowing, in dry weather, this month, which can ſcarcely fail of enſuring a good tilth the enſuing one. The ſoil proper for carrots being dry gravels, ſands, or loams, you may probably be able to plough them this month. This tillage will not be neceſſary, if the land bids fair to work fine in March. Let me here remark further, that, in caſe the land is very mellow, and in good order enough to harrow on this month's tillage, you ſhould by no means omit to ſow upon this plowing, and harrow in the ſeed; for although March is the common ſeaſon, yet the uncertainties of weather are ſuch, that the ſtate of the land, in moſt caſes, requires a greater attention than the name of the month; and carrot ſeed, let the weather be ever ſo ſevere, will take no harm: It may be ſown without danger in November; and, in caſe March turns out very wet, and your ſowing is driven into April, it is twenty to one but the crop ſuffers.

Cabbages

The fields, deſigned for cabbages in April or May, and plowed in October on to the ridge, ſhould this month, if the weather

weather will admit, receive an earth, reverſing the ridges, but not ſtirring flat. This will have good effects in pulverizing the ſoil, which it may be ſuppoſed to want, as it conſiſts only of ſtubbles turned up in autumn. This is a point that ſhould be attended to; for cabbages are always to be conſidered as a fallow, in which light their importance muſt appear ſufficiently great. As this tillage is the firſt that marks the land for the crop, (all ſtubbles being plowed in autumn, for whatever crops deſigned) it will be proper here to ſpeak more particularly of the preparation and deſign of the culture.

Some late authors have publiſhed ſuch extreme ſatisfactory experiments on cabbages, as food for cattle, that it would be unpardonable to paſs over the article in this work. They are ſaid to flouriſh to very great profit on all clays and good loams, and to have the particular property of enabling the farmers of clays and wet loams, to winter more cattle than thoſe of lighter lands can affect, by means of that excellent root, the turnip. The great evil of clay farms uſed to be the want of green winter food; which confined them in their ſtocks to hay alone, and conſequently prevented their reaping thoſe extended articles of profit, that ariſe from numerous heads of cattle: and beſides the immediate benefit from the cattle, they loſt alſo the opportunity of raiſing large quantities of dung, which never can be effected ſo well as by keeping cattle in winter. But all theſe evils are by the cabbage culture remedied, and the clay farmers put in poſſeſſion even of a ſuperiority over the turnip ones. If the difference between a ſummer-fallow year on clay, and a turnip-fallow on light land, be conſidered, the importance of this new diſcovery will appear ſufficiently clear. Thirty ſhillings an acre expence, of the firſt, is not an exaggerated calculation; but all is ſaved on the turnip land, perhaps with profit; and the barley, that follows the turnips, is probably as good, or nearly ſo, as that which ſucceeds the ſummer fallow on clay. Suppoſing the following clover and wheat equal in both, according to ſoil, ſtill there remains

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a great ſuperiority in the article of manure; for all that is raiſed by the conſumption of the turnip crop is ſo much ſuperiority to the clay ſoil. But reverſe the medal: ſuppoſe cabbages to be introduced on the clay, and the ſcene is totally changed: that crop will far exceed the turnips, yield much more profit, and enable the farmer to make a great deal more manure: for theſe reaſons, the recommendations cabbages have lately had, appear to be extremely well founded; and conſequently thoſe farmers, who poſſeſs the proper ſoils, cannot determine too ſoon to enter on the cultivation.

But there is another circumſtance attending ſome ſorts of cabbages, which make them highly adviſeable on all farms, which is their laſting for ſheep feed quite through the ſpring: the Scotch cabbage, turnip cabbage, cabbage turnip, and green boorcole, come into perfection the beginning of April, and laſts extremely well to the middle of May, the moſt pinching ſix weeks in the whole year. Turnips will do no ſuch thing; conſequently thoſe farmers, who poſſeſs turnip ſoils, ſhould on no account ſlight the culture of cabbages for this purpoſe.

Water-furrowing.

Obſerve well all new-plowed lands, to cut water-furrows through them, as ſoon as the fields are finiſhed. Saving a trifle of money in the omiſſion of ſuch a neceſſary work, often hazards a crop, and is ſure greatly to damage it. In making them have a ſure eye to the deſcents and variations of the ſurface, ſo that no water can lodge in any parts, however wet the weather. Look alſo to the old water-furrows in the wheat fields, and thoſe in the fallows plowed at autumn. If they are filled at any places, by the crumbling in of the moulds after froſts, or by the paſſage of moles, or other accidents, let them be cleaned out: too much attention cannot be given to keep your lands quite free from ſtagnant water.

Manure

Manure Graſs-Lands.

This is the proper ſeaſon for laying on ſeveral ſorts of manure, ſuch as ſoot, coal-aſhes, wood-aſhes, lime, malt-duſt, &c. and in general thoſe that are ſpread in too ſmall quantities require a whole winter's rains to waſh them in. The uſe of theſe manures, and other light dreſſings in February, are very beneficial; but, throughout the management of purchaſed manures, you muſt form ſome experiments for a year or two, before you extend the practice; to ſee which, at a given price, will ſuit your land beſt. Without this precaution, you may probably expend large ſums of money to very little purpoſe. Nor would I adviſe you to truſt to the mere appearance of the effect ſoon after the manuring; for ſome of them, particularly ſoot and malt-duſt, will ſhew themſelves the firſt heavy ſhowers, in a finer green than the reſt of the field; but your proof of it does not ariſe from fine greens, but weight of hay; and I have myſelf experienced, that the latter is not always an attendant on the former. Mark out contiguous half acres, calculate the prices of your manures, and ſpread on each piece a ſeparate one; all to the amount of 20 s. an acre, for inſtance. At hay-time, weigh the crops: you will then know which manure, at the given prices, ſuits your ſoil beſt. This knowledge will prove true experience, and a very different guide from proverbs or random ideas.

Manure Green Wheats.

This is likewiſe the ſeaſon for ſpreading ſuperficial dreſſings on the green wheats, ſuch as ſoot, aſhes, malt-duſt, pigeon dung, poultry dung, rabbits dung, &c. &c. and many other ſorts in the neighbourhood of great cities. This is very good huſbandry; but the profit depends on the expences. I ſhall venture to recommend your trying them in ſmall, (half

acre, for inſtance, to each) before you extend the practice to whole fields, eſpecially thoſe which are not dungs. As to the latter, provided the prices be not extravagant, there can be no doubt of their anſwering on all ſoils. Whenever a farmer has the choice of manures, never let him heſitate about which to take: he may lay it down as a maxim, that dungs of all ſorts are excellent: other manures may be the ſame, but they are not ſo univerſal reſpecting ſoils.

Farm Yard.

Throughout this month, attend well to the farm-yard, and all the buildings where cattle are kept: ſee that every place is kept conſtantly littered, ſo that every thing is clean; and, if the ſtock of litter laid in in autumn will not laſt, it is time now, that you agree with ſome neighbours for a weekly ſupply of refuſe ſtraw or ſtubble: at all events, do not let there ever be a want of litter, either in the ſtalls or the yard; for this is the only way of raiſing large quantities of dung at a cheap rate.

Tares.

This is a proper ſeaſon for ſowing tares, called, in ſome places, vetches, fetches, thetches. &c. The land I ſuppoſe ſtirred in autumn: the firſt ſeaſon in this month, that is dry enough, plow the land again, and harrow in three buſhels an acre of ſeed. I ſuppoſe them deſigned for making hay, or feeding green; but, if they are for a crop of ſeed, two buſhels will be ſufficient. Tares for hay make a moſt excellent fallow year: they are mown before they draw, or exhauſt the land at all, and their extreme luxuriancy and thick ſhade ſo mellow and looſen the ſoil, and kill all weeds, that, if the crop is good, and the ſeed ſown not later than February, you will have a very good chance for a crop of turnips after them, on one

earth;

earth; but, without ſuch luck, this huſbandry is far beyond ſowing two crops of corn running. If a farmer thinks of ſowing barley after wheat, barley, or oats, or oats after either, let him throw a crop of tares for hay between two of corn, and he will be ſure to reap the benefit of it. They will give him, on middling land, from a ton and an half to two tons and an half of hay *per* acre, which, with their cleaning and enriching nature, will be found far to exceed any ſecond crop of corn on the ſame land.

Water Meadows.*

This work is much neglected in England, and yet it is really important. Wherever a meadow or paſture is ſo ſituated, that water can be brought on it from higher grounds, whether by means of a river, ditches, trenches, &c. &c. it ſhould by all means be done, though ſome expence were requiſite to effect it. It will prove much the cheapeſt way of manuring; and, as it will be in your power, for moſt of the winter months, and executed annually, it will prove no leſs effectual than any other manuring. In caſe the water lodges in ſwamps or flat places, trenches muſt be cut through them, about a ſpade deep, and a ſpade and a half wide, to carry it off; becauſe it ſhould only run over the graſs, but not remain on it. Wherever your water is, whether in river, ditch, or trench, it ſhould be conducted over the graſs, at various places ſo as to water as much of it as poſſible. Suppoſe there is a ditch along the higheſt ſide of the field, the eaſieſt management is to bring the water into that ditch, and then, by various outlets, flow it over the meadow. If the quantity is ſmall, from one outlet at a time, ſtopping the reſt. I have many times obſerv

* By meadows the Engliſh mean, natural graſs or paſture ground

bſerved running ditches, that might be let on to graſs-lands, without the farmer's ever thinking of any ſuch matter; but the benefit of the practice is undoubted,

Potatoes.

This root is one of the moſt profitable crops the farmer can cultivate; nor does the advantage of it depend on markets for ſelling them: for they will pay a beneficial price, given to cattle of various ſorts, particularly hogs. In Ireland they feed their cows on them to great profit. The land, deſigned for potatoes, I ſuppoſe to have been plowed in autumn: they are to be planted the beginning of next month; and, as they affect a good tilth, it will be adviſeable to plow the land this month, preparatory to the planting earth, provided the weather be dry enough: but in this, as well as for all other crops, be ſure to avoid ever going on with your ploughs while the ſoil is at all wet.

As this tillage marks the land deſigned for this crop, it is proper to caution thoſe farmers, who are unacquainted with the culture, againſt applying too much land to it. If you have a great plenty of dung at command, you may enter largely into this huſbandry; but determine to plant no more land than you can manure at the rate of 25 or 30 large loads *per* acre; for one acre, well cultivated, will pay you better than five, or even ten, but indifferently managed.

ARTICLE XXII.

Of the Culture of Black Oats.

[From Muſeum Ruſticum, Vol. III.]

A correſpondent of the Editor's has recommended this eſſay to our notice, in hopes, he ſays, it may encourage a more general cultivation of this grain; which, as it is of a hardy nature, may be ſown early, and thereby is well adapted to many ſituations in Scotland, where late ſowing never fails to make late reaping; the danger of which is very often too ſeverely felt: the grey oats which is a very mean improfitable grain is very generally uſed in light moorland farms; where, by the rules here preſcribed, and which, he ſays, he has himſelf followed to advantage, the ſoil would ſecure a good crop of black oats; which, when properly cultivated, are as prolifick as the white oats, will yield as much meal, and are equally grateful to the taſte of horſes.

HAVING been for many years a practical farmer in the eaſtern part of the county of Eſſex, you will not, I hope, think me impertinent in troubling you on the culture of black oats, which I have very often to great advantage ſown.

Moſt of my neighbours prefer the white Poland oat, which may, I own, in ſome circumſtances of ſoil and ſituation be beſt. I prefer the black oats becauſe they are hardieſt, for which reaſon they ſuit beſt with my convenience; for, as a conſiderable tract of the farm I occupy is light land, I am under a ſort of neceſſity of ſowing this ſoil early, or, if a dry ſummer followed, I ſhould have no return at harveſt.

Few people allow more than one plowing for a crop of oats; but ſuch as follow this practice are very wrong-headed for they may aſſure themſelves, that no crop pays better for plowing than oats; and it is on this account that I generally give my land deſigned for oats three tilths; whence I am morally certain ariſes the largeneſs of my crops, for I have

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ldom under five, oftener ſix, and very frequently ſeven quarers from an acre, throughout a field.

Your readers will not be ſurpriſed at my having ſuch good rops, when I obſerve, that I almoſt every year ſow ſome oats n a fallow that has been well dunged; and this I aver to be ood huſbandry, as it abates the rankneſs of the ſoil, kills nany of the weeds, and prepares the land in an excellent nanner for a ſucceeding crop of ſweet wheat; but I muſt oberve, that I always clear my land of the ſtiff oat-ſtubble beore I attempt to plow for the wheat.

I have already ſaid that I ſow black oats early on my light and: by early, I mean as early as the firſt week in February, y which time I have generally an opportunity of getting he land in proper order, for a light ſoil is ſoon wet, ſoon ry.

Let me mention once more to your readers, that it is on a ight ſoil, which is apt to burn a crop, that I ſow my black ats ſo early as the beginning of February; for ſhould any of hem attempt to ſow them ſo early in a moiſt, cold, ſtiff ſoil, nd a hard froſt ſhould follow, the young blade would, in all robability, be killed.

I muſt alſo remark, that when I ſow oats thus early, it is generally under furrow; yet I ſometimes ſow them broadcaſt, and plow them in.

The quantity of ſeed I, for the moſt part, uſe, is about three buſhels, which I find to be enough; nay, I have ſometimes from only two buſhels had a good crop; but then I have been particularly careful and attentive to the goodneſs of the ſeed, without which precaution I ſhould not, unleſs the ſeaſon had been very favourable indeed, have ſucceeded.

I have found it a very good way to ſow firſt half my quantity of ſeed under furrow, and afterwards, ſowing the remainder broad-caſt, harrow it in; and this is often my practice when I ſow the latter end of February or the beginning of March.

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When I ſow oats after wheat, which however is not very frequently, I turn up the ſtubble as ſoon as I conveniently can after harveſt, and leave it rough through the winter. The firſt fine weather after Chriſtmas, I lay it down ſmooth with the harrows, and immediately give it a croſs plowing.

As ſoon as February comes in, if it is not a hard froſt, I make the land as fine as I poſſibly can by the harrows, raiſing a fine looſe mould to the ſurface, which is to be the bed for the oats to lie in; for I ſow my oats directly under furrow; after which I paſs a moderate-ſized roller over the field, and then give it a ſlight ſcratch with a pair of light harrows.

This huſbandry generally produces me a crop I have no reaſon to complain of.

My chief reaſon for troubling you with this letter is, to endeavour to perſuade my brother farmers, that they do not, in general, allow their oats a ſufficient number of plowings, one being the ſtated quantity.

If they would plow twice for this crop, they would receive more than twenty ſhillings an acre for their trouble; but if they would conſult their own intereſts, and allow three plowings, it would often make fifty pounds difference to them in a field of twenty acres: this they will, perhaps, think wonderful; but it is no leſs true.

The black oats require particularly to be ſown early, eſpecially if the farmer wiſhes to have them of a fine gloſſy ebon colour, and that the crop ſhould corn well; for if they are ſown late, and wet weather follows ſoon after ſowing, they will be apt to run all to ſtraw; and if dry weather, and the ſoil is gravelly, it is a chance but they are burnt up.

I have found by experience, that black oats will yield a very large crop after turnips; and this I believe is ſimply owing to their being ſown in a fine tilth; for the mould cannot but be reduced to very ſmall particles if a crop of turnips has been well huſbanded, eſpecially if it is in a light ſoil.

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ARTICLE XXIII.

Of the beſt method of cleaning corn lands from weeds.

[In a Letter to the Editor.]

YOUR 26th queſtion, Vol. I. page 29. *What is the beſt method of clearing our corn lands from weeds?* is in-ed a very important one to Scots Farmers. There is no rt of good huſbandry in which we are ſo far behind our ighbours in England and Holland, as this. The moſt part our light grounds, eſpecially ſuch as lye in the neighbour-od of towns and villages, and in general that part of every rm which is called in Scotland Croft-ground, has been ſuf-ed to collect the ſeeds of annual weeds for many ages; ſo t one, travelling through the country, in the ſummer nths, when theſe weeds are in the flower, ſees nothing in ny cultivated fields, but a continued blaze of theſe beauti-but deſtructive flowers; the riſing corns are inviſible; and harveſt when he examines the ſheafs, a conſiderable part them conſiſts of the ſame weeds which have by this time n new ſeeds, and polluted the ground for many ſucceeding ps.

Every farmer that has common ſenſe, knows and feels the ſchief he ſuffers from this ſource. He knows that weeds his crop of a part of the nouriſhment it would otherwiſe w from the earth, and which is yet worſe prevent it from iving the beneficial influence of a free circulation of air; he knows from experience, though perhaps he may not reſs it in ſuch terms; but he will tell you, that his crop mothered and choaked by the weeds. Every farmer is ſen-e of the riſk he often runs in harveſt, in winding or dry-his corns, from a mixture of certain weeds bound up with corns, that if the crop was clean, it could be carried in,

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in half the time; in ſhort every farmer is ſenſible that the benefit of good tillage and expenſive manure is always leſſened, and ſometimes uttterly deſtroyed, by this nuiſance, and himſelf robbed of a conſiderable part of the value of his crop. Yet under a ſenſe of theſe things, how many go on from year to year, patiently bearing theſe diſappointments, inconveniences and loſſes, without ever attempting to remedy them? Shall I ſay from mere indolence and lazineſs! No, not altogether, for many common farmers do not deſerve any ſuch reproach; but rather from a kind of hopeleſs dejection and deſpair. They conſider this loſs as a neceſſary evil which muſt be ſubmitted to. The enemy has already gained ſuch ſtrength that they deſpair of ever being able to ſubdue and to baniſh him from their territories; at leaſt by any means but ſuch as they think beyond their power, that is beyond their purſes.

Theſe things have tempted me to jot down a few imperfect hints in anſwer to the above queſtion. Not that I have turned my attention more to this than to other parts of farming or have diſcovered any thing in this branch, which I think worthy to be communicated to the public, but chiefly, that I may ſtir up more experienced farmers to correſpond with you upon this point, and ſend you ſomething more ſatisfying founded upon their own practice. For as I have already ſaid this is one of the chief points of improvement, with reſpect to which the farmers in Scotland need both to be inſtructed and animated, and without which all others will move on but ſlowly: a few plain judicious directions here are likely to be generally acceptable and uſeful.

There are a great variety of weeds that infeſt our tillage grounds; ſome that propagate by the root and remain continually in the ground; others that propagate from the ſeed, and ſpring up a new, from year to year; and a few which propagate both ways, ſuch as the dock; it equally infeſts grass and tillage grounds, and I know no better way to get rid

it, than carefully to pull it up by the hand, whether in corn or paſture grounds, at a time when it can be pulled even a day or two after a plentiful rain. As to the firſt, the root weeds, it is very difficult to clear the ground, at leaſt from ſome of them, ſuch as the reed-graſs, coltsfoot, and ſeveral others; but the annual weeds which ſow their own ſeeds are in far greater quantities, and much more formidable to the farmer; at the deſtruction of theſe the following directions are chiefly pointed. The firſt of theſe annual weeds which appear amongſt our oats are the wild muſtard, and wild turnip, called by the farmers here Rounces; theſe chiefly infeſt light grounds, ſeldom do much harm on ſtiff clay grounds, and are reckoned leaſt dangerous in harveſt. Theſe are ſucceeded by the wild marygold, which our farmers call Gule, a much more deſtructive and dangerous weed in every ſhape, appearing in all ground, light and clay, croft and outfield. Theſe three ſorts of annuals prevail in all parts of Scotland that I have ſeen. The ſeeds of them ſeem to ly in the ground without vegetating, till brought near the ſurface, for years, nay probably for ages. The longeſt reſting of ground ſeems to have little effect to deſtroy them. In gravelly grounds, which have lain in paſture eight and ten years, I have ſeen the wild turnips and muſtard appear in prodigious quantities, even in the ley crop if the ſeaſon happened to be dry, ſtill more in the ſecond; in the third the marygold commonly appears, and they continue to encreaſe as long as the ground is in tillage. From any experience that I have had, I reckon a dry ſummer more favourable to theſe weeds than a moiſt one; or, to ſpeak more properly, leſs favourable to the crop, I mean it runs a greater riſk of being hurt and choaked by them. I could mention other annual weeds, common on moſt grounds; the ſwine thiſtle thought to be encouraged by lime; the common thiſtle; but farmers are in uſe to weed out theſe by the hand, though they abſurdly ſuffer the laſt to grow and come to ſeed on their paſture grounds, and their light ſeeds to be waſted by the wind over their own corn fields and their neighbours

neighbours to a very great diſtance. I am not perfectly ſure, however, whether the thiſtle on paſture grounds may not be a different ſpecies from that which grows in corn fields.

Beſides, a proper care, which every farmer ought to take to clean his ſeed corn, to prevent the ſeeds of weeds from being carried from his barn yard or any other places, to his dung-hill; and to have his dung ſufficiently rotted, and theſe pernicious ſeeds thus deſtroyed; in order to clean his corn fields from annual weeds, the following methods may be conſidered and tried.

I. *A clean and thorough ſummer fallow.*

This is the moſt effectual of all methods, and yet the moſt unlikely to be tried by the common farmer. He is ſenſible of the diſtant profit, but is frightened by the preſent loſs—the loſs of his rent for a whole year; and the expence of ſix or eight plowings. Yet I know a common farmer ſo wiſe and ſo determined upon this point, that, with no great ſtock, not L. 150 upon a farm of 90 acres, for which he pays L. 60 of yearly rent, and the remainder of a tack, which when it came into his hands was not above ten or twelve years; yet fallows at the rate of 15, 20, or 22 acres yearly, and will therefore, in a courſe of four or five years, clean his whole grounds. This however is a ſingular inſtance, which deſerves, and I hope will meet with all due encouragement at the end of the tack beſides the reward of wiſdom and induſtry even before that time. Yet it cannot, and ought not to be expected, that the generality of farmers will venture on this practice, and purſue it ſo far as to go over the whole ground in their farms, till they get longer tacks than nineteen years, and learn to plough with two horſes. Whatever may be done for the ſake of a crop of wheat, in Eaſt-Lothian, and round Edinburgh, Glaſgow, and other great towns, fallowing is a practice ſcarce known in the weſt of Scotland.

II. *Hor*

. Horſe-hoed crops of Potatoes, Turnips, Carrots, Cabbages, and Beans.

This is a method almoſt as effectual as the former, when the ows of the potatoes, &c. are ſufficiently wide, even ſix feet diſtant om each other. And it has this great advantage above e former, that it is attended with no immediate loſs; but in me of theſe crops with a preſent and certain gain. Beſides e grand, and the only point, for the ſake of which I men- on it at preſent, the cleaning of the ground for the benefit ſucceeding crops; a common farmer may eaſily raiſe upon is croft grounds horſe-hoed crops of potatoes, carrots, cabba- es, which, after deducting all expences, will be more valuable him than any crop he can expect; but his other objection is, at he is unaccuſtomed to it, and that ſuch crops require more tention and trouble than he can beſtow. Let him try, how- er, an acre or two, and go on with more if the trial ſucceeds; will not, I imagine, repent the trial. A year or two will ake him ſufficiently maſter of the horſe hoeing operations. e needs no new implements but a ſmall plough, ſuch as a ngle ſtout horſe can eaſily draw; the Scots form is as pro- r as any other; it will coſt him about a third leſs than his reſent plough, it will be uſeful to him in fallowing his bar- y, and for many other purpoſes. With reſpect to the atten- on and trouble, the farmers here beſtow ſix times more in ltivating a rood of potatoes with the ſpade and the hand-hoe, an two acres of horſe-hoed would require.

I do not deſcribe the operations and the times of them juſt ow, ſo minutely as to make them perfectly intelligible to a mmon farmer; it would ſwell this letter to an undue bulk, d is a new ſubject. It will be ſufficient to ſay, that I look on potatoes, as the moſt profitable of all the horſe-hoed ops named, though I confeſs I have not yet tried the reſt to extent ſufficient to aſcertain this point. But potatoes is a ot with which our farmers are well acquainted, both as to

the culture and the uſe of it to their families and to their cattle. They are accuſtomed to plant it with the plough, though not to hoe it. If an acre is intended for this, it ought to be plowed once or twice before, in winter and ſpring, and harrowed ſo as to fill up the old furrows, as much as may be, then laid out in new and deep furrows with a four-horſe plough, ſtraight, parallel and diſtant from each other, at leaſt four feet, ſix feet or as wide as you pleaſe. I only lay dung in theſe furrows or rows. I hoe at leaſt five times in the months of June and July, and each hoeing coſts about three hours work of a ſingle man and horſe; I dig them with the ſpade. The value of an acre of potatoes cultivated in this manner, the rows at four feet diſtance, if the ground and the ſeaſon anſwer, is from L. 12 to L. 1 ſterling, often more. The expence of the firſt plowing, dung, ſeed, planting, hoeing, and digging, charging every thing at the common price of labour, &c. in this country, is conſiderably within L. 4. Theſe however coſt the farmer no money, as he furniſhes and does every thing with his own cattle and ſervants. When I ſpeak of the value of the crop, I mean the value to the farmer at a diſtance from any great town. This is calculated at the price he gets for a few pecks from his neighbours; he can not ſell his whole crop at that price, there is no ſale for it in ſuch a ſituation; but I conſider them as of that value to his family, and I aſſure you I do not exaggerate, but ſpeak from full knowledge and experience. I have ſeen potatoes planted ten and twelve feet diſtance in the rows. This will diminiſh the produce from the acre one half. In this caſe, the deſign was not only to give a fallow to the ground, and to clear it of weeds, but to level high ridges; and after this was in ſome meaſure accomplished, a row of turnips was ſown exactly in the middle between every row of potatoes, and as late in the ſeaſon as poſſible, to leave time for their growing to any bulk after the potatoes had got their due, the operations of hoeing were ſtill continued for the ſake of the turnips. I look upon 3 feet however as ſufficient for all the purpoſes of fallowing, a

in the ſucceeding crop of wheat, can ſee no difference betwixt this preparation of the ground and a clean ſummer fallow.

The ſoil proper for potatoes is a dry light looſe free ſoil; the nearer it approaches to ſand ſo much the better for that root. That part of his crop which is moſt inclined to clay and retains the moiſture, will not anſwer for potatoes or carrots; in place of them, the farmer may ſubſtitute cabbages. But he cannot raiſe the plants. Why? they are as eaſily raiſed almoſt, as green-kail plants. Even theſe, I mean green-kail, would, I doubt not, be a very profitable horſehoed crop, tho' I have never ſeen them tried. They will grow on any ſoil, and are much improved by dung, which they ſeldom get in this country; or the farmer can drill with his hand, or dibble two rows of beans, which will anſwer his ſtiff ſoil in place of potatoes, and hoe them in the ſame manner. This, though the leaſt profitable of all the horſe-hoed crops, will yet indemnify him for the dung, trouble, and time ſpent on the fallow. But his neighbours will laugh at him for ſuch whims. It is very likely they may, and he will laugh at them next year in his turn, when he ſhews them a clean crop of wheat or barley.

III. *Harrowing down the weeds.*

To clean corn fields, ſuffer the moſt part of the annual weeds, within the reach of vegetation, to ſpring fully, and then deſtroy them when the ſeed is ſown, by a thorough harrowing; and about two or three weeks after, by a ſecond ſlight harrowing. This is the ſimpleſt method imaginable, to clear the ground of this nuiſance for a ſingle year. It is a method which may be eaſily practiſed by every common farmer, without much danger of being expoſed to the ridicule of his neighbours. It is ſtrange, it never has occured to many judicious and thinking men among themſelves; and yet more ſtrange that few of them will follow it, when they ſee the benefit of it before their eyes! It may be done at the ſowing of Poliſh oats, which on early ground,

ground, needs not be ſooner than the firſt or ſecond week of May. But the moſt convenient grain for this operation, and indeed the only one with which it can be done to purpoſe, is barley or bear, becauſe this is ſown later than any other.

Let the farmer, inſtead of leading out his dung for his bear, in the beginning of May, when he commonly ſtirs and ſows it, lead it out in the end of March, or at lateſt in the firſt week of April, and lay it down on the ground he intends for bear, fallowed or plowed we ſhall ſuppoſe only once before, during the winter, or very early in the ſpring. Let him ſpread the dung evenly on the ſurface of the ground, and plow it down in the uſual way, as if he intended inſtantly to ſow his bear or barley. But inſtead of this, after perhaps a ſingle tine of light harrowing, let the ground lye in that ſtate for four, five, or ſix weeks, as the ſeaſon anſwers; that is, till the ordinary time of bear ſowing. Againſt that time, moſt part of the annual weeds within reach of the influence of the ſun and air, will have vegetated, or be ſprung, encouraged as they will be, by the ſeaſon of the year, if in any degree mild and moiſt, and puſhed forward, by the heat of dung. The whole field will be covered by them, quite green, and the more ſo, the fouler it has been before. Let not the farmer be discouraged by this unpromiſing appearance, let him rather congratulate himſelf upon it:—Let him not be perſuaded by his neighbours, to give the field a third plowing, (as I have often been adviſed to do) the effect of this, would only be, to bring up to the ſurface, a new crop of theſe accurſed ſeeds, which have never ſeen the ſun, and give them an equal chance with his own precious ſeed. Let the farmer chuſe a dry time which having no dung to lead, he has more in his power than his neighbours; and without fear ſow his ſeed (giving a little more than uſual) upon the top of the green carpet, be it never ſo thick; let him deſtroy its verdure effectually, by the brea harrow, and continue at it till the ground be all black. About twelve days, a fortnight, three weeks, or even longer, as the weath

weather anſwers, let him give another harrowing with the light harrows, without fear of hurting the tender crop; or if it is hurt, draw the roller over it to tranſplant whatever was torn out.

It was, if I remember right, in the year 1766, when the ſeaſon was remarkably favourable for theſe different operations, by frequent warm ſhowers, to bring forward the weeds, and ſufficient heat and drought to kill them at the harrowing, that I had an acre of bear on the fouleſt ground imaginable, and yet by this management ſo perfectly clean, that you could ſcarce have found a ſingle weed in it. I have always ſince that time found conſiderable benefit from the practice, but I confeſs never ſo much as then. You will eaſily ſee, that this method is chiefly calculated for deſtroying the wild muſtard and turnip which ſpring early: the marygold, being a later plant, has a better chance ſome of it to eſcape; yet the grain being, in its moſt tender ſtate, freed from the incumbrance of the early weeds, quickly grows ſo ſtrong of itſelf, as to maſter and deſtroy the later weeds. I really believe, that the firſt crop of weeds, many of which have come to a conſiderable bulk when deſtroyed by the break harrow, and rotting near the ſurface of the ground, has the ſame good effect as a ſlight dunging or top dreſſing has: it raiſes a degree of fermentation, or gentle heat, which nouriſhes and cheriſhes the riſing grain; while at the ſame time it is too ſtrong for the ſmaller ſeeds of the weeds, juſt beginning to vegetate, and is ſufficient to kill many of them. Thus, what ſeems moſt deſtructive to the crop, may be turned to its improvement. Indeed, ſuch is the wiſdom and goodneſs of the great author of nature, apparent in the general courſe of her various operations, that it is reaſonable to believe, that the few things, which ſeem to have a pernicious tendency, might be turned to ſerve very ſalutary purpoſes, had we ſufficient attention and ſagacity to diſcover the proper methods of doing it.—But to return.

IV.

IV. *Oats ſown on a winter tilth, and harrowed a-new after they are well ſprung.*

This, like the former method, has a chance to kill two crops of the annual weeds, one by the winter froſt and the firſt harrowing, and another by the ſecond. Farmers may learn many uſeful leſſons from gardeners, and the methods of culture they purſue. Obſerve that part of the garden which happens to be laboured and dreſſed before winter, for flower-roots, early cabbages, or any other purpoſe. It continues, during a great part of the ſummer, much cleaner of annual weeds, than the reſt of the garden digged and dreſſed in the ſpring.—The above practice can only be followed, when the ground is pretty free of root weeds, and peſtered chiefly with annuals. The crop of oats will receive little prejudice from the circumſtance of its being ſown on ground conſolidated or battered by the winter rains. Oats will do with any ſort of tillage, and almoſt without tillage at all; not ſo well, to be ſure, as upon a fine tilth. If your grounds be clean, give a ſecond tillage or not, as you pleaſe; but if they are foul, your oats will ſuffer much more from the weeds raiſed and encouraged by the ſecond tilth, than from the want of it.

V. *Sowing Beans or Peaſe.*

Sowing beans, and in ſuch grounds as will not anſwer with beans, ſowing peas, with the hand, in drills, in every ſecond furrow after the plow; and hoeing the ſpaces between the rows, with the hand as oft as they will bear; according to the ſenſible directions given in a letter, [Vol. I. p. 246.] from Eaſt Lothian, ſigned RUSTICUS. I take this opportunity, the firſt that has offered, of returning my thanks to RUSTICUS, for the information contained in his letter, and requeſting (with your leave), his further correſpondence.

Any

Any thing he chuſes to ſend in the experimental way, will, I dare ſay, be uſeful and acceptable to the public. I had practiſed that method of ſowing beans ſome years before I ſaw his letter, at the ſame diſtance, and nearly in the ſame manner with him; yet have been obliged to him for ſeveral judicious hints, and particularly as to the quantity of ſeed in which, from the trial made this year, I believe he is perfectly in the right. It gave me pleaſure laſt ſummer, to ſee this ſort of huſbandry creeping in, all round Edinburgh both Eaſt and Weſt, tho' it has not yet reached the more diſtant parts of the country. I obſerved however, that they hoed their beans, only with the Engliſh hand-hoe, which cuts and draws the earth towards the workman, and requires many repeated ſlight ſtrokes. I have always uſed, in this buſineſs, the Dutch hoe, which puſhes from the workman, and being open in the middle, lets the weeds and earth through. Farmers ſhould have them made for this buſineſs, from ten to fourteen inches broad, or wide, thus they will command at one ſtroke, the whole ſpace between the rows of the beans, and do the work in a third, perhaps in a half leſs time than the Engliſh hoe: As the beans are ploughed in, I am doubtful whether they receive much benefit from the earth drawn into their ſtalks; if this be thought neceſſary, the ſecond hoeing may be done with the Engliſh hoe.

VI. *Laſtly*, A luxuriant crop of any kind, eſpecially red clover, or peas, aſſiſted by a ſlight top dreſſing of lime and dung, will raiſe a fermentation on the ſurface of the ground, and effectually deſtroy the ſeeds of the annuals that would have ſprung that year, as well as prepare the ground for a ſucceeding crop, that will produce the ſame effect in an inferior degree, the next year. Indeed the four laſt hints reach no further than a ſingle year; but if ſuch practices be frequently repeated, they will make the ground gradually cleaner and cleaner. A farmer can ſummer-fallow and horſe-hoe only

only a ſmall part of his ground at once; and the other methods may be attended to, and purſued as far as they are thought reaſonable, in the reſt of his tillage grounds, till they are likewiſe fallowed or hoed in their courſe, and the whole farm gone over according to the two firſt methods, which are the only effectual methods of cleaning it that I know. When once the light grounds of a farm are tollerably clean, no attention or pains ſhould be ſpared to keep them in that ſtate, or which amounts nearly to the ſame thing, to keep them in heart; by never over-croping them after they have been limed and manured; by a judicious change and ſucceſſion of crops; avoiding the repetition of white crops, particularly oats, which perhaps are more favourable to annual weeds than any other, and laying them down often with graſs ſeeds for hay and paſture.

I heartily approve, gentlemen, of your deſign, and wiſh you may receive that aſſiſtance in the execution of it which you deſire, and ſeem to expect, from experienced farmers, and which many of them are well qualified to give you. Independent of this, you have an inexhauſtable fund at your command, for the entertainment and inſtruction of your readers; you can lay before them well choſen extracts on ſome of the moſt neceſſary and important branches of farming, from books, which moſt of us have little time and opportunity to peruſe. If you continue, to go on in the tract in which you have happily ſet out, and confine your attention entirely to practical huſbandry, I am convinced you will narrate many facts, and ſuggeſt many things, worthy of the attention of all farmers, which, if they are not uſeful to the generality of them, will yet be realy uſeful to the attentive and candid part of your readers; for as one of our beſt practical writers juſtly obſerves, *None but the wiſe can be made much wiſer, and to him only that hath ſhall be given.* I am, SIR,

Ayrſhire, your moſt humble Servant

Jan. 19th. 1774. TITYRUS

ARTICLE XXIV.

Malt-duſt or Cumming recommended as a Manure for Young Graſs.

[In a letter to the Publiſher.]

AGRICULTURE without doubt is the firſt of arts, ſince all others depend upon it. The farmer therefore is the firſt and moſt important member of ſociety: of conſequence, every attempt to aſſiſt him to manure and cultivate his ground to the greateſt advantage, is an attempt to ſerve the public, and in fact is worthy of praiſe.

I pretend not, Mr Printer, to be one of thoſe uſeful perſons who have it much in their power to be ſerviceable to ſociety this way, though I acknowledge it would not be moving out of my own ſphere. I might indeed teach any farmer the methods which I have diſcovered as moſt advantageous in the management of my own farm; becauſe this knowledge is the reſult of ſeveral years practice: but I cannot pretend to diſcover, like the chymiſt, the peculiar property of matter, and whether it is likely to become a valuable food for plants, or any ſuch nice things as this.——What I propoſe to mention to you is, the effects of malt cumming as a valuable manure for young graſs. I never made the experiment upon any other. It is true, there are a variety of circumſtances to be conſidered, in making experiments, in different ſoils and different climates; and allowance muſt be made for theſe, elſe the reſult of them will appear perhaps quite the reverſe of each other: but if I may be allowed to judge, from the happy effect the cumming has had upon my field, which is perfectly evident, it is well worthy the recommending to others. Let them be applyed any time in the buſy ſeaſon of malting, in ſuch proportion as may be judged moſt proper, they muſt not be known too thin; I cannot pretend to fix the quantity moſt proper for an acre, as I did not apply mine on purpoſe to acquire ex-

experience; at leaſt I was almoſt quite ſatisfied that it was as much a hum as Baron Van Hauk's moſt wonderful manure, though much leſs expenſive. I therefore only recommend it to the trial of others, who have not been diſguſted by the expenſive commodity above named, and its induſtrious venders. How amazing the credulity of mankind! how impudent the impoſtor who can practiſe upon the ſimplicity of farmers!

Haddington,
Jan. 5th, 1774. ANONYMUS.

*** We will be much obliged to our correſpondent, for an account of his further experience of this manure; although it can never become a general manure, as it can be obtained only in ſmall quantities, and in the neighbourhood of great towns and maltſteads; yet to ſuch as can obtain it, this notice of its utility will be of moment.

The following article from the Muſeum Ruſticum Vol. III. ſhows that it is not a meer conceit; but is already well known and practiſed in England. And as the experiments therein narrated appear to have been made with great accuracy, and at the ſame time contain a comparative trial of other manures, we could not deny our readers the advantage and pleaſure of it.

ARTICLE XXV.

On the benefit of Malt-Duſt, as a manure for a ſtiff ſoil; with a relation of ſome experiments, made to aſcertain its virtues.

[From Muſeum Ruſticum, Vol. III.]

FOR the benefit of your farming readers I ſhall communicate a few experiments I made ſome time ſince, in order to try the virtue of malt-duſt as a manure for a crop of wheat.

I had often heard it aſſerted, that malt-duſt was much better ſuited, as a manure, to barley than wheat; for the latter lying a whole year in the ground, and the malt-duſt being ſown with it, the virtues of the manure were exhauſted long before the ſummer, when the corn principally wants nouriſhment, being advanced in its growth, and ſerved chiefly to make the wheat winter-proud.

Others, contradicting this aſſertion, ſaid it was beſt for wheat, and made it appear that it often cauſed very good crops of corn, particularly after a hard winter.

Being determined in my own mind to try ſome experiments in order to determine this matter, I pitched upon a field of ten acres, which had born a good crop of horſe-beans; after which it was ſown with turnips, which being fed off, it was ſummer-fallowed, being intended for wheat.

The ſoil was a ſtiffiſh loam; it was in good heart, and tolerably clean.

I divided this field by deep furrows into ten equal parts, each containing one acre, numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

The whole field, during the courſe of the fallowing, had four plowings, which reduced it to a fine tilth.

When wheat ſeed-time came, I ſowed number 1. broadcaſt, with three buſhels of wheat, and plowed it in, laying on no manure whatever.

Number 2. I ſowed with the ſame quantity of wheat, after which I ſtrewed over it ten quarters, or eighty buſhels, of malt-duſt, and plowed that and the ſeed in together.

Number 3. I ſowed alſo with wheat in the ſame manner, except that I deferred ſtrewing on the malt-duſt till the latter end of January.

Number 4. had a dreſſing of dung in the ordinary way, and was ſowed with three buſhels of wheat like the other parts.

Number 5. was dreſſed by ſheep folding, and was alſo in like-manner ſown with wheat.

Number

Number 6. was ſown with wheat in the ſame quantity, and in February, after ſowing, received a half dreſſing of very rotten dung, which had been ſeveral times turned and mixed.

Number 7. after receiving a plowing in the ſpring, was ſown with ten pecks of barley, which was harrowed in, and no manure at all applied.

Number 8. was ſown with barley, as above, but had ten quarters of malt-duſt laid on it.

Number 9. had in the winter a good dreſſing of dung, and was in the ſpring ſown with the ſame quantity of barley.

Number 10. was ſown with barley, like number 8. only it had five inſtead of ten quarters of malt-duſt laid on it.

It may be neceſſary, perhaps, to obſerve, that all the pieces of wheat were ſown the firſt week in October, and all the barley the ſecond week in March.

Soon after Chriſtmas I went to take a view of my wheat, when I found that the acre marked number 2. looked moſt forward and flouriſhing; though I muſt own there was in appearance but little difference between that and number 4.

The numbers 1, 3, and 6. neither of them looked ſo vigorous as thoſe already noticed; and number 5. ſeemed rather thin on the land; but the wheat plants were in good condition and healthy.

In May I took another view of my wheat crops, and found number 1. tolerably clean, and promiſed well.

Number 2. gave me hopes of a large crop, and was ſurpriſingly clear of weeds.

Number 3. was greatly improved ſince the laying on of the dreſſing of the malt-duſt.

Number 4. looked very vigorous and ſtrong, but was very foul, having ſeveral ſorts of weeds not to be met with in other parts of the land.

Number 5. was thin of plants, and they did not branch much; however, they ſtill ſeemed healthy and ſtrong.

Number

Number 6. was like number 3. greatly improved; but it was foul, and, what appeared ſtrange to me, had many weeds of a nature quite different from thoſe with which number 4. was infeſted, though the dung laid on both theſe parts was taken from the ſame heap.

I, at this time, alſo looked at my pieces ſown with barley, when I found number 7. promiſing and clean.

Number 8. was forwarder, and flattered me with the proſpect of a large crop.

Number 9. was forward and fine, but foul with weeds.

Number 10. bore much the ſame appearance as number 8. and promiſed as well.

At harveſt number 2. of the wheat was firſt fit to reap, after which ſucceeded number 4. the reſt were ready nearly at the ſame time.

Of my barleys, numbers 8. and 10. were firſt ready to mow.

I ſuppoſe it is unneceſſary to obſerve that thoſe crops which were cleareſt of weeds were the ſooneſt fit for carrying.

I ordered theſe crops to be all laid ſeparately; and as I was obliged, juſt after Michaelmas, to go up to London, about ſome particular buſineſs, I left orders with my grieve, that they ſhould all be ſeparately threſhed and dreſſed as early as might be in the winter.

The produce of the ſeveral crops was thus diſtinctly noted to me, for I had ordered that particular care ſhould be taken not to mix one with the other, and on enquiry, I found my orders were punctually carried into execution.

	Buſhels.	Pecks.
Number 1. unmanured, yielded of wheat——	20	1
Number 2. manured with malt-duſt when ſown — — —	28	3
Number 3. manured with malt-duſt after Chriſtmas, by way of top-dreſſing —	41	0

Number

Number 4. manured with dung in the ordinary way — — —	32	2
Number 5. folded with ſheep — —	29	3
Number 6. dreſſed with rotten dung in February — — —	30	0
Number 7. unmanured, yielded of barley—	32	3
Number 8. manured with ten quarters of malt-duſt when ſown — — —	48	0
Number 9. manured with dung in the winter	40	2
Number 10. manured, when ſown, with five quarters of malt-duſt — —	44	0

I muſt, with your leave, treſpaſs upon your readers patience, till I make a few obſervations on the above ſtate of the produce of my crop.

Firſt, I conclude, that when malt-duſt is uſed as a manure for wheat, it is beſt to lay it on by way of top-dreſſing after the corn is come up, as the crop of number 3. yielded above twelve buſhels more than that of number 2. and I am apt to think that the virtue of the malt-duſt laid on number 2. was exhauſted before it could be of any eſſential ſervice to the crop; whereas, in number 3. the manure began to yield forth its virtues juſt as the wheat plants began to be in want of a freſh ſupply of nouriſhment. It was alſo obſervable, that the grains of wheat which grew on number 2. were thinner, and had leſs ſubſtance, than thoſe of number 3. the grain of which was fine, plump, and heavy.

The produce of number 4. convinces me that malt-duſt is, in many caſes, a better manure for wheat than dung, not only as it gives a larger encreaſe, but alſo becauſe it does not ſtock the land with deſtructive and devouring weeds.

The wheat grown on number 5. was as fine as that of number 3. but conſiderably leſs in quantity, as appears by the account.

I do not much approve of the method purſued in number 6. yet it is a good alternative, if the farmer happens to have too little dung to dreſs all his fallows.

I judge alſo malt-duſt to be a very good and profitable manure for a barley crop; but the yield of number 10. being forty-four buſhels, and of number 8. only forty-eight buſhels, which laſt is not an encreaſe in proportion to the additional quantity of manure laid on, I thence judge that eight quarters, or ſixty-four buſhels, of malt-duſt, is the proper quantity of malt-duſt to lay on an acre for a barley crop, and that at the time of ſowing.

When I ſpeak of malt-duſt, I mean the kiln-duſt, which falls from the malt in drying: as to the tail-duſt, which falls through the ſcreen whilſt the malt is cleaning before it is put up in ſacks, that may be applied to a better uſe, being generally given to pigs, and often to cows, in which laſt caſe it makes them give a great deal of milk.

It has been ſuggeſted, that the virtue of malt-duſt, as a manure, laſts only for one crop; but this is a miſtake, for when this manure is laid on in January or February, a good crop of barley may be had after the wheat.

Malt-duſt is of a very warm nature: this has induced many farmers to think that it will burn a crop; and I will not anſwer for it but it might do ſo on a hot gravelly ſoil; but on clay land, or a ſtiff loam, it ſeldom or never does any damage: and indeed the only danger is a dry time enſuing after it is ſpread on the land, for the firſt ſhower of rain waſhes it in, and ſecures the crop from all hazard of being burnt.

Many of my acquaintance, beſides myſelf, have found that malt-duſt is for a ſtiff ſoil a better manure than dung; but the diſpute among them was, whether it was moſt profitable to lay it on when the wheat was ſown, or by way of top-dreſſing in January or February; however, ſince I made the above experiments, they are all converts to my opinion, and

are

are determined in future always to dreſs their heavy wheat land with it after Chriſtmas.

One thing more in recommendation of this my favourite manure, let me add, before I conclude, that nothing ſurpaſſes it when laid on cold graſs grounds, to the amount of about eight quarters, or ſixty buſhels, on an acre, but not leſs.

Such as have not ſeen its effects in this way applied, would be ſurpriſed at the large encreaſe of ſweet feed which it occaſions: in ſhort, whoever finds it neceſſary to dreſs ſuch land, and can get malt-duſt in a ſufficient quantity, will do well to uſe it, as they will be puzzled to find any thing in the extenſive circle of manures better adapted to the purpoſe.

I ſhould be glad, if ſome of your correſpondents would give the public their opinions relative to the various diſorders to which cattle are ſubject: this is a large field, and has, I think, had but little ſaid of it in your collection.

In relating experiments in huſbandry, a great deal will ſtill be left to be regulated by the farmer's prudence, experience, and diſcretion, as circumſtances of ſoil, ſeaſons, &c. muſt vary; but in this matter of the diſeaſes of cattle, if the ſymptoms of each diſorder are but carefully pointed out, and the proper remedies laid down in plain language for the different ſtages of the diſorder, there will be very little danger of the honeſt farmer's making any miſtakes to his prejudice.

The fellows who go about the country, pretending to cure the diſeaſes of cattle, are, in general, great cheats, getting much money, but doing little good. I never could perſuade any of theſe gentlemen to let me examine the drenches they gave my cattle, being, probably, fearful I ſhould thereby be enabled to diſcover and detect their groſs ignorance.

ARTICLE XXVI.

Of the Culture of Peaſe—Of the Culture of Beans.

[Dickſon's Agriculture VOL. II.]

THE pea is a grain very different from any of thoſe already mentioned. A crop of it is not ſo valuable as a crop of the others, though it is much uſed in ſome places by the common people for bread.

In ſowing peaſe great regard is paid to the value of the ſtraw; and the advantage, that the land, upon which it is ſown, is ſuppoſed to receive from the crop. Peaſe-ſtraw is reckoned better feeding for horſes than any other kind of ſtraw, and, if a crop of peaſe does not enrich land, at leaſt it does not take ſo much nouriſhment from it as a crop of any of the other grains mentioned. When the crop is good, the ſtraw covers the ground, and thereby preventing a free communication of air, deſtroys all the ſmall weeds. The preventing a free communication of air, occaſions likewiſe a fermentation with the rain and dew upon the ſurface, by which the particles of the ſoil are minutely divided, and the vegetable paſture greatly enlarged. Beſides, peaſe puſh down their roots much farther than any of the white grains, and draw part of their nouriſhment from below the reach of the plough. The corruption of the weeds, deſtroyed by the peaſe, and the enlargement of the vegetable paſture, by the fermentation of the corrupted air and water, are ſuppoſed to do more than over-bal-

lance all the loſs of the vegetable food carried off by the crop.

There are two kinds of peaſe cultivated in our fields, called the white and gray. The white is the moſt common, and generally, as appears from the ſeed, is a mixture of ſeveral ſorts. All of them ſeem to be ſpecies of the pea cultivated in our gardens; there is ſcarcely any difference, but in the colour of the flower and ſeed. The gray is different, and ſeems to be a ſpecies of the vetch or tare: This one is the hardieſt plant of the two, and thrives on ſoils, and in climates where the other kind does not ſucceed.

The two kinds are frequently mixed together, and in ſome places, the white wears out, and in a few years, nothing but the gray remains. On other ſoils, the gray wears out, and nothing remains but the white. A little attention to this will point out to the farmer, which of the two he ſhould ſow. The ſtraw of the gray peaſe is rather better than the ſtraw of the white, the peaſe themſelves are as good for horſes; and therefore, the farmer ſhould give ſome attention to this kind where the other does not thrive, though the value of the grain be not ſo great.

The white pea is divided into two particular kinds, called hot ſeed and cold ſeed. Theſe names are given for the ſame reaſon that they are given to the oats. The ſowing of the hot ſeed may be delayed three weeks after the cold ſeed is ſown, and yet the peaſe be as ſoon ready. It is obſerved, that of the cold ſeed there is ſometimes a great crop of ſtraw and very few peaſe; and of the hot ſeed, that when there is a good crop of ſtraw, there is always plenty of corn likewiſe. This, if true, points out, that the hot ſeed are the moſt proper to be ſown, when the land is in very good order, and no danger of the crop failing.

The time of ſowing is from the firſt of February to the end of April. According to the principal deſign in ſowing, the peaſe ſhould be ſown earlier or later. The earlier ſown peaſe have

ave the beſt chance to produce a crop of corn, and the late
wn to produce a crop of ſtraw. The growth of
ants is, generally ſpeaking, checked in the month of July
drought and heat, and is promoted again by the rains in
e month of Auguſt. It may be obſerved, that graſs, that
the month of July is parched and withered, in the month
Auguſt attains a new verdure. If the peaſe are ſo far ad-
nced, as to be beginning to fill in the warm ſeaſon, their
owth is ſtopped, and the grain fills; but if they are only in
e bloſſom at that time, though their growth may be a little
ecked, yet it comes on again in the month of Auguſt, and
ey continue growing without filling till ſtopped by the froſt.
s one year in four or five the peaſe crop fails, and the peaſe
ſe to a very great price, it is not proper to riſk the whole
op, by delaying to ſow all the ſeed till late in the ſeaſon.
hen the land is clean and in good heart, the peaſe may be
wn early, becauſe on ſuch land, a good crop both of corn
d ſtraw may be expected. But if the land is foul or wet,
e ſowing of the peaſe ſhould be delayed as long as poſſible,
ecauſe on ſuch land the crop is more precarious, and the fail-
g of a crop of peaſe gives ſuch encouragement to weeds, as
endanger the following crops likewiſe. When this happens,
ſometimes it will, notwithſtanding all the pains that can be
ken, it is neceſſary to plow in the crop, to prevent the bad
onſequences that may follow. For when a bad crop of peaſe
allowed to ſtand, it does more harm than all the value of
e crop.

The quantity of peaſe ſown upon the acre, is from four to
e and a half firlots. In ſowing peaſe, regard is to be had,
t only to the ſituation of the land, but alſo to the principal
ſign of the crop. If the principal deſign of ſowing peaſe is
have ſtraw and to enrich the land, then they ſhould be thick
wn; for when thick ſown, they have a better chance to de-
roy weeds, and to cover the ſurface, than when thin ſown.
ut if the principal deſign is to have a crop of corn, they
ſhould

ſhould be thinner ſown; for when thin ſown, they have mo
air and fill better. It is to be obſerved however, that there
greater danger ariſing from thin ſowing of peaſe, than fro
thick ſowing. Peaſe do not ſtool as other grains do, the
only branch out from the ſtalk. When the land is good, th
other kinds of grain, by ſtooling, ſoon cover the ſurface, b
it is long before the peaſe do this when they are thin ſown
thereby great encouragement is given to the growth of weed
and the drought allowed to penetrate the ſoil.

Peaſe are commonly ſown after oats or barley, and ſome
times after wheat. Seldom more than one plowing is give
and they are commonly ſown immediately after plowing
The reaſon of this is, that they may be the better covered, f
the ſooner that any grain is ſown after plowing, it is covere
the deeper. If rain comes ſoon after peaſe are ſown, it mak
them ſwell much; and if they are not well covered, the
come above ground, and are deſtroyed by vermin, or ſplit i
two, and thus the young plant is deprived of part of its ſup
port. When any grain ſwells in the ground, it ſwells moſt
upward, for on that ſide it meets with leaſt reſiſtance; and be
ſides, every kind of ſoil by heavy rains is at firſt battered, an
rendered more compact, by which means, the ſoil that cover
the ſeed is waſhed down from it.

Though peaſe are commonly ſown immediately after plow
ing; yet ſome farmers ſow them upon the winter furrow
They plow the land early in winter, and ſow the peaſe earl
in the ſpring. This is a good cuſtom when the land is ſti
and clean. Stiff land when plowed has a very rough ſurface
which, though leſſened a little by the winter froſt, yet affords
ſufficient covering for the peaſe when ſown; and the land whe
plowed, being better expoſed to the air and froſt than whe
unplowed, affords more nouriſhment and a better paſture f
the crop than when plowed immediately before ſowing, an
then harrowed. Beſides, it is late in the ſeaſon before th
kind of ſoil is ſufficiently dry for being plowed, and thereſo

it may well be ſuppoſed, that it is in better order for receiving a winter than an early ſpring plowing.

Sometimes the peaſe are ſown and plowed in. This does very well on light land, particularly after a crop of barley, the culture of which makes the ſoil open. But ſtiff land is apt to turn ſo hard upon the ſurface as to prevent them from getting up, eſpecially if drought comes on after a wet ſeaſon.

When peaſe are ſown under furrow, the furrows of the ridges muſt be ſown after the land is plowed, and before it is harrowed, for there is no ſeed left in them. If the ridges are cloven, or the furrows turned into crowns, care muſt be taken in ſowing, to prevent, as much as poſſible, the ſeed from falling into the furrows towards which the ridges are to be plowed, for it is ſcarcely poſſible to prevent the ſeed from being too thick in theſe places.

The land deſigned for peaſe is, generally ſpeaking, cloven. This is a good cuſtom when the ridges are ſteep, as all of them were ſometime ago. As wheat or barley are generally ſown after peaſe, the land muſt be plowed before winter. Gathering is the moſt proper way of plowing before winter, and this follows beſt after cleaving. But if the ridges are not high, caſting is the beſt method of plowing for them, or if the ridges are flat and narrow, they may be plowed in the ordinary way, the former plowing reverſed, and the furrows turned into crowns.

Peaſe are generally the loweſt priced grain, and yet ſometimes they riſe to a great price, when the prices of the others are moderate. This makes a ſcheme for ſaving ſeed of importance. The ſowing in drills anſwers this purpoſe. For in drills one firlot ſows an acre as completely as four in the broad caſt way. But as peaſe ſown in drills, take a long time to cover the ſurface, great encouragement is thereby given to weeds. To deſtroy theſe hoeing becomes neceſſary. This indeed is expenſive; but if hands can be got, the ſaving of ſeed does more than ballance the expence, a better crop may

be

be expected, and the weeds more effectually deſtroyed. The operation of drilling may be performed with very little trouble and expence. A drill barrow puſhed by a boy, follows the plough, and as one row is ſufficient for two furrows, one barrow ſows to two plows. But the advantages of drilling ſhall be conſidered afterwards.

Of the Culture of Beans.

The bean has a reſemblance to the pea, only it grows with a ſtronger ſtalk, and ſtands upright. Peaſe and beans are often ſown mixed together. This method is found to ſucceed very well, they ripen at the ſame time, require the ſame culture, and ſerve the ſame purpoſes. Beſides, the beans having ſtrong ſtalks and ſtanding upright, in ſome meaſure ſupport the peaſe, and give them air; by this means the peaſe become more fruitful.

What has been ſaid with regard to the culture of peaſe may be applied to beans. However, it is neceſſary to obſerve that the bean puſhes its root further down than the pea does, and therefore requires a deeper ſoil. It ſucceeds much better than the pea in a cold wet ſoil. The lands in Scotland, where beans are moſt commonly ſown, and where they ſucceed beſt, are deep and wet clays. This may ſerve as a direction to the farmer when he ſhall ſow peaſe and when beans.

On ſome lands the crops of beans are very great, and almoſt as valuable as of any grain. This ſhould encourage the farmer to ſow them on his richeſt lands, and take ſome care in their culture. There is no crop, it is ſaid, that ſucceeds better in the drill huſbandry than a crop of beans. The ſeed may be ſown in every other furrow; in every two contiguous furrows, while the next two or three are paſt; and in a variety of other ways. But in whatever manner it is ſown, if the land is proper for beans, and the weeds carefully hoed out, it ſeldom fails to produce a good crop.

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ARTICLE XXVII.

THE FARMER's KALENDAR

MARCH.

BARLEY.

THIS is the proper month for getting all the ſeed barley into the ground.* Crops, later ſown, may be very beneficial;

* In Scotland the earlieſt time practiſed for ſowing barley, is not before the end of April or beginning of May: Nay for the greateſt part in the end of May, and with ſome ſlovenly farmers the beginning of June. This may ſeem to make the caution we gave in the beginning of our excerpts from this work p. 15. very neceſſary: But when the whole of this paragraph is conſidered, the proviſions and exceptions he makes, rather eſtabliſhes than weakens the authority of this author. That a great part of the barley in England is ſown in March, is very certain; and it is as certain, that in Scotland we are generally too late in all our ſeed time. A diſquiſition into the cauſes of this difference might prove very uſeful. A late ſowing never fails to make a late harveſt; and the dangers of a late harveſt are often too fatally felt, not to require ſome attention to inveſtigate a remedy. If the climate is in fault, then indeed our caſe is deſperate: But if we ſee farmers, who, by a proper application of draining, plowings, manuring, water-furrowing, &c. &c. have forwarded the barly-ſeed time a month, yea two months more than was formerly in uſe upon theſe grounds; need we deſpair, by carrying that attention ſtill further, if not to become quite ſo early as in England, to approach at leaſt a great deal nearer to their ſeaſon of ſowing than we are at preſent. We are aſhamed almoſt to mention, to the diſgrace of Scots agriculture, that in ſome places, to this hour, the farmers do not ſtrike their ploughs

beneficial; but, if all circumſtances were equal, the March-ſown would be ſuperior to any later ſeaſons, which is the only comparative point of conſequence. This grain is ſown after various preparations: turnips are the moſt common; which root will not laſt for feeding any cattle, with propriety, upon the average of ſeaſons, longer than this month: ſo that the turnip-land barley muſt be ſown on one earth, or the ſeaſon abſolutely loſt; for April and May ſowings are always inferior. I am not here aſſerting, that April is a month quite improper for ſowing barley: I know the contrary from experience; but I will venture to aſſert, that if ſoil, plowings, manuring, water-furrowing, &c. &c. are equal, a March ſowing will exceed an April one, on an average of ſeveral years, by ſix buſhels in the crop. Saying, therefore, that barleys in certain places, ſown in April and May, yield great crops, is ſaying nothing, unleſs you add, at the ſame time, the parallel ſucceſs of other crops ſown in March. Neither do I venture to inſinuate, that all March-ſown crops are to be ſucceſsful: one indiſpenſable neceſſary in ſowing moſt crops, but barley in particular, is the land being quite dry. March may paſs quite away, without a ſingle plowing ſeaſon, in the whole month, for wet lands. In ſuch a caſe, I certainly cannot miſtake ſo greatly, as to adviſe the ſowing barley; but ſtill this is not in reference to a particular practice, but to a general maxim

ploughs till a certain day, nor will they upon any account begin to ſow till another fixed day, let the ſituation of the ground and the weather be never ſo inviting. The deſign of this publication was to combat ſuch unreaſonable prejudices; and in their room to introduce better practices, founded upon reaſon and ſupported by experience. This end we ſhall endeavour to keep in view, and we beg leave again to repeat our former requeſt to the farmers of this country, gentlemen and yeomen, to ſupport us in our views, which we hope will be approved of as laudable and patriotic.

in husbandry. You ought never to suffer your ploughs to work, if the land is wet; consequently, advice to sow barley in March must always be under the proviso, that the land is dry enough to plow.

Turnip land, not cleared till this month, can only receive one plowing, and have the seed harrowed in: if more earths are given, the sowing time will be driven much too late. In this case, on many soils, the land will not be turned up in fine order: Six bushels should then be sown on each acre of land, unless the fertility is great, when five will do. Summer-land barley, on clay, or other heavy soils, should always be sown on one earth, in the first dry plowing season, whether in February or March. In some clay countries, the farmers have an exceeding good barley culture: they summer fallow their land, and lay it up on three-feet ridges, well water-furrowed for the winter. In a hard frost, they carry on their dung, and leave it in heaps till sowing time, when they spread before the ploughs: this is incomparable good husbandry, and can never fail of good crops. It is conducted, upon the same principle, upon beans, pease, tare, potatoe, or carrot land: all which crops are taken up in autumn, and the land plowed after them, on to the ridge, and well water-furrowed, ready for the spring-sowing. The great point is, to have the soil, previous to the crop, in such good order, that no other spring tillage may be necessary than the seed-earth. In such husbandry, there can be no fear of having good crops, nor is it practised any where, where bad ones are reaped. Upon lands thus managed, four bushels of seed per acre, if the soil is rich, are sufficient; and to harrow in the whole, the best way of covering it.

Much the most profitable way of cultivating barley, is to throw it into a regular course, preparatory to the clover. For instance: 1. Turnips. 2. Barley. 3. Clover. 4. Wheat. Or, 1. Cabbages. 2. Barley. 3. Clover. 4. Wheat. Another: 1. Fallow. 2. Barley. 3. Clover. 4. Wheat. Whatever variations may arise in the crops, still barley must always follow either

either an ameliorating crop, or a fallow, and in all caſes be followed by clover. In many parts of the kingdom, unacquainted with clover, this latter reaſoning may appear bad; but that can only ariſe from falſe ideas of the uſe of clover. Let good graſs lands be ever ſo plentiful, they will in no caſe be found to preclude the uſe of clover. Farmers, even on graſs farms, that know not what to do with large crops of clover, I will venture to pronounce unworthy the name of farmers. No man, that has money in his pocket, can be at a loſs to know how to diſpoſe of any ſort of food for cattle. What would any man wiſh to follow a barley crop? No ſort of corn can ſucceed, according to the plaineſt principles of common good *huſbandry*. To ſubſtitute pulſe inſtead of clover, is certainly bad management; for the graſs will prove as beneficial as either beans, peas, or tares, and it will more profitably prepare for wheat. That grain, ſown upon a clover lay, muſt always be on one earth, which is a moſt favourable circumſtance; and the propriety of keeping the land under the clover two, three, or four years, during all which time, the crops will be extremely fine, is another very ſtrong argument. The mere amount of the clover crops is not the only enquiry; the *clear* profit of them is the great object; and graſs, in that reſpect, is of peculiar advantage to the farmer, whatever his ſoil is; for clover, as long as it laſts, will pay a much greater profit, clear of expences, than any crop of corn the farmer can ſubſtitute, which, with the advantage of breaking it up for corn, either wheat or oats, renders the clover huſbandry an abſolute appendage to that of barley.

In reſpect to the management at ſowing, there are two methods that are very different: the one is to harrow in the ſeed with, or upon, the barley-ſeed; the other, to ſow it before the roller, after the barley is up. The reaſon of the latter practice has been owing, I apprehend, to the barley-crops in wet ſeaſons, ſuffering a good deal from the luxuriant growth of the clover. I have had ſeveral fields of barley half ſpoiled by

by clover, ſown with the corn. This reaſon is a very good one in many ſituations; but I think, with proper management, the evil might be eaſily remedied. I ſhould propoſe the crop to be mown for hay, as ſoon as the barley began to ear: the great quantity of clover among it, which there muſt be to endanger the crop, would, with the barley, make an admirable one of hay, and, I apprehend, fully equal in value to the amount of a good barley one: Farmers are too apt to view corn, ſacked up in market, as the only object of huſbandry, becauſe it is moſt ſaleable: they would act much wiſer, if they eſteemed the food of cattle as equally advantageous. Corn they prefer to beef, merely becauſe it does not require ſo much ſtock in hand; but the difference between theſe productions, in other reſpects, is very great: for what compariſon can be drawn between crops that exhauſt the ſoil, and fill it with weeds, and others (the food of cattle), that ameliorate and clean it?

Oats.

While oats ſhould now be ſown in preference to any other ſeaſon; and, in the general conduct of them, the farmer ſhould, by all means, avoid the common error of ſowing them after other corn-crops, by which they exhauſt and ruin their land. They ſhould always receive the ſame preparation as barley; nor ought a good huſbandman to think of their not paying him as well for ſuch attention as that crop. It is a very miſtaken idea, to ſuppoſe it more profitable to ſow barley on land in good order than oats. I am confident, from divers experiments, that oats will always equal, and, in many caſes, exceed barley. The ſuperior quantity of the produce will ever be found to more than anſwer the inferiority of the price.

What good reaſons are to be offered for ſowing oats on land in ſuch bad order, that barley is not to be ventured in, I know not: I have never heard any ſatisfactory ones. The common argument is their hardineſs, which will give you a middling

crop,

crop, about ſufficient to pay expences, and leave a trifling profit, when no other crop will do the like; but this is only proving them to be aſſiſtants of bad huſbandry; nor is ſuch a paltry profit, granting falſe premiſes, (for I am well perſuaded, that common oat crops, among bad farmers, are but ſo much loſs,) an object that ever ought to influence good huſbandmen. Why ſhould a good farmer be at all ſolicituous to gain 10 s. an acre profit by oats after barley, &c.? Suppoſe his courſe to be: 1. Turnips. 2. Barley. 3. Oats. Or, 1. Fallow. 2. Wheat. 3. Oats. In either of theſe courſes, or in any other, where the oats follow another crop of corn, the profit of them muſt be very trifling. What compariſon with ſowing clover with the barley, which will pay far more profit, and at the ſame time prepare, in the beſt manner, for that moſt beneficial crop, wheat? What but a fallow, or a fallow crop, can ſucceed the oats? How unprofitable, compared to the clover ſyſtem!

For theſe reaſons, I cannot but ſtrongly recommend to all farmers, that they ſhould conſider oats and barley quite in the ſame light, and never ſow the one, unleſs they know their land to be in proper order for the other: To ſow them after a fallow crop, and clover with them, in the ſame manner as with barley. Upon rich lands four or five buſhels per acre are the proper quantity of ſeed oats; but, on weaker ſoils, ſix or ſeven ſhould be ſown.

Peaſe.

This month is the proper ſeaſon for ſowing all ſorts of peaſe, that were not ſown in February; nor is it proper to delay any of them later, if the weather now ſuits. White peaſe ſhould be ſown laſt, and on light land; for they do not ſucceed well on heavy or wet clays. There are ſcarcely any ſoils, that do not ſuit ſome pea or other: Stiff clays do very well for the hardier hog-peaſe, and all lighter loams, gravels, chalks, and ſands anſwer well in the tenderer kinds: they are bo

both plowed and harrowed in; which variation ſometimes makes a conſiderable difference in the crop; for if the land is apt to bind with rain, and the peaſe are plowed in, they ſometimes do not riſe at all, not having ſtrength to pierce the blaſtured ſurface: but this evil only attends the very binding ſoils: on the contrary, when the ſeed is only harrowed in, if the field is not very well watched, the pigeons and birds will carry away much of it, and ſome allowance in the ſeed ſhould be made for it. If land breaks well with the harrow, it is beſt to harrow in on all, but the very lighteſt lands; but on looſe lands, or very light and porous ſoils, or thoſe that are extremely dry, it muſt certainly be preferable to plow it in, on account of having a greater depth, and being farther from the ſun, which is apt in hot ſummers, to burn theſe ſoils up.

Sow peaſe after corn; they always come in beſt after wheat, barley or oats, generally with good huſbandry after wheat, becauſe, in a farm truly ordered, barley and oats ſhould ever have clover ſown with them. I can hardly ſuppoſe a ſituation, where this is not the right management: they come very properly into ſuch courſes as theſe: 1. Turnips. 2. Barley. 3. Clover. 4. Wheat. 5. Peaſe. Or, 1. Cabbages. 2. Oats. 3. Clover. 4. Wheat. 5. Peaſe. Whenever wheat ſucceeds clover you may throw in a crop of peaſe after it, if it ſuits you better than to come again to turnips, cabbages, or beans, the firſt of the courſe.

Drilled Peaſe.

This pulſe is, in ſome places, drilled, which is a very good method, and by no means to be condemned ſo generally, as moſt farmers do all crops that are ſown by a drill plough. The great uſe of drilling peaſe, is the rendering it ſo much eaſier to hand-hoe them. Good farmers, whatever their ſoil, are always deſirous of getting the hand-hoe into as many crops as poſſible, and few pay better for it than peaſe; but when promiſcuouſly ſown, the work is difficult and expenſive to perform well; whereas, if they are drilled in equally diſtant rows

one

one foot, or nine inches aſunder, the hoeing is as regular work as can be conceived: it will be executed much eaſier, better, and cheaper, and the crop be conſequently ſuperior. Another advantage in this method is the ſaving of ſeed; for a buſhel, or a buſhel and a half leſs ſeed, will do thus than in broad caſt ſowing. Here, therefore, is a caſe, in which drilling is really profitable, and will exceed the common huſbandry. The point of admitting the hand-hoes better is a very important one; for that operation, given while the crop is quite young, checks the weeds ſo much at the ſame time that the crop is forwarded, that the tendrils join the ſooner, and much the ſtronger for it; and, conſequently, the good effect of a thick luxuriant crop, gained in a much compleater degree. But let the farmer, when he agrees to uſe the drill plough for this work, not be perſuaded to change his purpoſe of hand-hoeing, in order to introduce a horſe-hoe in wider intervals; that is, to ſow two or three rows equally diſtant, and then, paſſing a ſpace of two or three feet, drill a freſh ſyſtem of rows, the intervals for ploughing. This is more complex huſbandry, and will not anſwer ſo well; for the peaſe are very apt to fall into the intervals and be damaged by the horſe and plough; an evil that has very bad conſequences. The profitable drilling, therefore, requires a plough that will ſow ſeveral rows equally diſtant at once; the greater the number, the quicker the work is done.

Tares.

If the weather in February did not allow your ſowing tares, or at leaſt, all your crop, the work muſt not be delayed longer than March, or the crop will ſuffer. The beſt way, is to plough the land flat, or on broad lands, and harrow in the ſeeds; but obſerve well, that the ſoil is dry before you go on with your ploughs; which is an univerſal rule, that ought never to be deviated from.

Carrots

Carrots.

This is the ſeaſon for ſowing carrots: February, if the weather is unuſually dry, is preferable; but, upon an average of ſeaſons, the work will not be expedient till March. Plough the land in the common manner, but flat, and ſow broad-caſt about four pounds of ſeeed to an acre, and harrow it in at thrice. If the weather is unuſually wet, you may be prevented from getting on to the land; but, if poſſible, delay it no longer. The proper ſoil ſhould not be miſtaken through common notions, nor confined to a compaſs much within the reality. It is a general idea, that nothing but ſands will do for carrots; but this is a moſt miſtaken notion: the beſt ſoil in the world for them is a ſandy loam, rather light, but moiſt, of a great depth; in which you will find very little difficulty in ploughing to the very beam of your plough; and all the ſoil you bring up of the ſame kind, and as fit for vegetation as the ſurface. This ſandy loam, with theſe properties, ſhould, in general, yield good crops of all ſorts: the black-ſands the beſt. But, at the ſame time, that I mention this ſort, as of all other ſoils the moſt deſirable, ſtill I deſire to add, that the crop will thrive to moſt noble profit on heavy loams but not clays; good wheat-loams, for inſtance, of the gravelly kinds, that plough pretty eaſy. At firſt ſight, ſuch ſoils might, perhaps, be thought too ſtiff; but the truth is, no kind of land will yield larger carrots; perhaps the groſs-crops will be as large as on the beſt ſands: but then the expences will run higher in cleaning, *&c.* I have known carrots tried on clays, and been made, by dint of tillage and manure, to anſwer on them; but the huſbandry is not adviſable.

If you would command your crops of this root, you ſhould, before the ſeed-earth, manure the land with twenty-five, or thirty loads of dung per acre, pretty rotten: plough it in, and then cover the ſeed by harrowing. Such a conduct will inſure very conſiderable crops, and pay better for the dung than

than perhaps any other application whatever. I have heard of dung ſpoiling or injuring carrots, making them grow deformed, giving them the canker, and making them ill-taſted; but I muſt remark, that I never remember any ſuch effect in the many crops I have ſeen in different places. A farmer's object is, to produce as great a quantity as poſſible from every acre, and that muſt undoubtedly be by the help of manure.

I cannot leave this article, without recommending to all the profeſſors of the lighter ſort of lands that have a pretty good depth, to cultivate this excellent root with ſpirit, not to confine it to a little cloſe of an acre or two, but to introduce it, in the courſe of the crops, on a farm regularly, like wheat, barley, turnips, or any other plant. I am confident none will pay them better; and if they manage it tolerably, not one on the whole farm half ſo well: they will find the profit, on an average of ſoils and ſeaſons, not leſs than ten pounds an acre clear, which will much exceed the advantage of three average-crops of wheat, with the great benefit of improving a remarkable cleanſer, and as ameliorating a crop as any in the world.

Potatoes.

March is the beſt ſeaſon in the year for planting potatoes. The land, I ſuppoſe, to have received its firſt tillage in autumn; and, if it was inclinable to be rough, to have had a ſecond ploughing in February. The firſt dry ſeaſon in this month, it ſhould be ſtirred again flat, turning in the manure of whatever kind: the beſt is rotten farm-yard dung; and the more that is laid on the better, unleſs the ſoil be very rich. Upon an average of lands, leſs ſhould not be laid, than twenty five or thirty large loads per acre, which ſhould be ſpread equally, that it may plough in well. As ſoon as the ſurface is harrowed ſmooth, the planting ſhould be begun, which is beſt performed in this manner: a man holds a triangular dibble in his hands, which has three points, and

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place for him to ſet his foot on it, to ſtrike it into the earth; it ſo makes three holes at a time to receive the ſetts. A boy follows him with them, and drops one into each hole. After this, the land is harrowed twice or thrice, and the buſineſs is done. They are in this method, ſet promiſcuouſly, at from nine inches to one foot aſunder: the work is done quickly, and is not expenſive. Another way, is to lay them in furrows after the plough, which is leſs expenſive, but never ſo well done: they are not planted deep enough, nor are the ſets well covered without a very minute attention to the ploughs. In the promiſcuos way, from fifteen to twenty buſhels of potatoes are wanting to ſet an acre.

Potatoes on Graſs.

Graſs land is often broken up for a crop of potatoes, and by moſt people preferred to any other: the methods are, firſt, to dung it moderately, fifteen or twenty loads per acre; then to dig up the turf, and work in the dung at the ſame time, and dibble in the ſets, in the way before mentioned. You ſcarcely ever fail of great crops in this method. Another is called the lazy-bed way: you dung the graſs as before, and mark it into beds five feet wide, with narrow ſlips between them two feet wide: you then dung the beds about fifteen loads per acre; on the dung you lay the potatoe ſlices, after which the turf is dug thinly up in the two feet intervals, and laid on the ſets, which, with another ſpit, and the looſe mould, completes the covering. This is a good method, but not equal to digging the whole ground, on account of its being left whole for the ſucceeding cropt; but the crop of potatoes is generally good: for beſides the dung, they have the turf below to ſpread upon, and are partly covered with that from the trenches; ſo that they lye hollow, and in a rich bed.

Potatoes on Borders.

If you have any rough borders of fields, that were grubbed

up to clear away roots and rubbiſh the preceeding winter, it is very good huſbandry to dig them regularly the beginning of this month, and dibble them with potatoe ſets, by which means you are ſure of getting a beneficial crop; for ſuch places are generally very fertile, from the rotting of leaves and wood; and they will be left ready in autumn for carrying the earth on to the land, in order to level the border, and lay it down to graſs. Such points as theſe are much neglected by the generality of common farmers, and yet the profit of them cannot be diſputed: they are much too fearful of every little expence out of the uſual road, and think every ſhilling ſo laid out is loſs. When ſome rich earth is thrown out of ditches, or mud out of ponds, it is very often left long enough for yielding a potatoe crop, which either will do in good perfection, but without ever being thought off for that purpoſe. Theſe are objects, that a dilligent attentive man ſhould always have in his eye, and he will aſſuredly find the profit of them.

Potatoes for Horſe-hoeing.

The new huſbandry has been much recommended for the culture of potatoes, and there have been many inſtances of great crops gained in this manner. The practice of it is various; but, in whatever manner, the land ſhould be plowed on to ridges for them, according to the rows intended. They have been tried in equally diſtant ſingle rows, at two, three, four, and five feet; in double rows, at one foot on four feet ridges; the ſame on five feet ridges, and three rows on five feet ridges. Theſe methods may moſt of them have ſucceeded; but the wide diſtances between the ſingle rows certainly loſe too much land. If equally-diſtant rows were uſed, three feet muſt be preferable to the others; double rows on four feet I ſhould prefer, and treble on five feet: in which methods you have the advantage of the horſe-hoeing culture without loſing much room. Equally-diſtant, at two feet, with a neat horſe-hoe that turned no furrow, only cut the ſurface of the ground, would

would probably be very ſucceſsful. The principle of introduc ng the horſe-hoe, is to ſave ſome of the expence of hand-hoe- ng, and at the ſame time to make the crop flowriſh better. The advocates for this huſbandry acknowledge, that there are more plants in the old method; but they aſſert, that the til- age of the plough is ſo much more effectual than that of the and-hoe, and the admiſſion of air among the plants ſo much freer, that the loſs of number is more than made up in the gain of ſize. It has been ſaid, however, that horſe-hoeing is ſo effectual that there is no occaſion for dung with it; but let all good farmers be very ſuſpicious of ſuch aſſertions. If they give up the benefits of rich manurings for any purpoſe ſo imaginary, they will certainly repent it. Potatoes may, in certan ſoils, be cultivated to profit without dung, but never equally; and on moſt lands it is abſolutely requiſite.

Cabbages.

There are two principal ſeaſons for planting cabbage-crops deſigned for cattle, viz. the latter end of April, and the be- ginning of May, and about mid-ſummer. The land for both, I ſuppoſe, plowed the firſt time at Michaelmas: if February was very favourable for tillage, another earth was then given if the teams had leaſure for it. Thoſe fields that were to be planted in April and May muſt, undoubtedly, be plowed a- gain in March. Theſe ſtirrings are not to be flat, but the land kept on the ridge by reverſing. If you have as much time this month to ſpare from ſeed-earths (which are ever the moſt important part of tillage) as you will have in April, it will be alſo adviſable to plow thoſe lands that are for the mid- ſummer crop: by which means you will be ſure to gain a fine tilth late in ſpring, which is the beſt method of deſtroy- ing ſeed-weeds.

The beginning of this month is the proper time for ſowing the ſeed: for this purpoſe you muſt proportion the ſeed, and ſeed-bed, to the intended quantity of your crops. A good rule,

rule, according to the account we have of this culture, is to ſow one pound of ſeed to every four acres of land intended to be croped. For a ſeed-bed, make choice of a rich piece of land ſummer-fallowed, and dunged with rotten ſtuff. If you deſign ten acres of cabbages, let the ſpace be a rood, there is no occaſion for any ſpade and rake work; the plough and harrow will do to the full as well. As to the ſorts of cabbages, it is adviſable to have the great Scotch, the turnip cabbage, and the green boorcole; and if your ſtock is various, as in general, you ſhould allot the Scotch to beaſts and cows, and for ſheep to the middle of April, and the turnip, cabbage, and boorcole, for ſheep alone, from the middle of April, to the middle of May; by which means you will have no trouble in providing for your cattle throughout the winter: the point of all others, which has moſt perplexed our farmers. But I ſhould obſerve, that the cabbages, planted out in April and May, muſt be the Scotch alone, and they are to take the cattle from graſs, and carry them through till January. The directions given above, for ſowing in this month, are relative only to the crop tranſplanted into the field at midſummer.

Turnip-fallow.

The land deſigned for turnips, I ſuppoſe to have been plowed from a ſtubble at Michaelmaſs; in this month it ſhould receive the ſecond earth, which is very neceſſary, that you may, by harowing well, or by another ſtirring in April, if the land is ſtubborn, be able to make it ſo fine, as to inſure a thick crop of weeds in May; a ſucceeding plowing turns them in, and quite deſtroys them. This is a method that is very effectual in deſtroying ſeed-weeds, and particularly ſuits turnip-fallows, as it is a crop that requires a very fine tilth, whether the land be foul or clean.

Sowing Clover.

March is a principal clover ſeaſon for ſowing with barley or oats, that ſucceeded either a fallow or an enriching fallow crop.

rop. The proper quantity of ſeed for an acre of land is wenty pounds. Many farmers ſow much leſs; but it is a ery faulty practice. There are two methods of covering it; ne, by harrowing, when the barley is ſown, and by rolling, hen the barley is rolled after it is up; this difference is oc-aſioned by clover harrowed in with the crop of barley, in wet eaſons, very often ſpoiling it, from a too great luxuriance of rowth.

In the management of a farmer's crop, he cannot give too uch attention to clover. I do not think a better rule can e laid down, than ſowing it with all the barley and oats on farm. More of thoſe crops ſhould not be cultivated than roper to ſow with graſſes: if there is more, it muſt be from ad huſbandry in ſecond croping. In farms chiefly arable, his neceſſity is ſo great, that, with a different conduct, a man an expect nothing but loſſes. In ſuch farms, the dependence or the cattle is on this graſs alone. What fatal effects, herefore muſt follow a neglect of cultivating a ſufficient uantity of it! The farmer ſhould conſider well the profit of lover, before he ſows ſpring-corn without it: the expences conſiſt in nothing but ſeed, which ſcarcely ever amount to more than five ſhillings an acre. Now, what other crop can e ſow, that will coſt him ſo little? But the product is as conſiderable, when well managed, as that of any other plant nown for hay: it yields two crops of a great burden; and, n the feeding cattle, it much exceeds, for horſes, ſheep, and ogs, any common graſs-land. But the great excellency f clover, is its cleaning and ameliorating the ſoil: if the ſeed s ſown with a firſt crop of corn, while the land is in good eart, and free from weeds, you may keep it under clover rom one to three years, and then break it up either for wheat r oats on one earth, and be ſure of having an extreme rich, s well as clean crop of either; an object, conſidering the owneſs of the expences, and other circumſtances, of very great onſequence. While the land is under clover, it is undoubted-

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ly fallowed only without the expence of common fallows. Of this fact, there cannot be a clearer proof, than the great crops of wheat gained after it on only one earth. Was clover an exhauſting plant, ſhould we ſee this ſo often? If any wheat-crops are peculiarly favourable, and generally ſucceſsful to an uncommon degree, it is the clover land ones. Let therefore the good farmer take a reſolution to ſow no barley or oats without clover. If he religiouſly follows this maxim, and never ſows it with a ſecond or third crop, it is impoſſible his lands ſhould be in bad heart or foul. So much of his farm will be under fallow-crops, and he will be able to keep ſuch conſiderable ſtocks of cattle to raiſe manure at home, that his fields muſt always be in excellent heart, very different from thoſe of his ſlovenly neighbour, who is eager after nothing but corn.

Sowing Ray-graſs.

This graſs is very valuable on ſeveral ſoils; but the cultivator ſhould be careful of introducing it on improper land. Mixed with clover, it is of great uſe on moſt light ſoils; but on heavy, wet loams, or clays, it is as pernicious a weed as a farmer can throw on his land. On ſands, ſandy loams, gravels, or poor gravelly loams, &c. it improves the clover, eſpecially when mown for hay: clover and ray-graſs hay, mown early enough, is equal to any. For feeding, its principal uſe is early in the ſpring, when the value is extremely great; for it is the firſt graſs commonly ſown by farmers that ſhoots. With good management, you may, in general, command a fine bite for ſheep and lambs by the middle of April, which is gaining a full month on any country in general. If the clover and ray-graſs be ſown with a firſt crop of corn, the land clean and in good heart, it will be ready for the ſheep by the beginning of April. The importance of ſuch food is then very great; and ſhould, on no account, allow of any undiſtinguiſhing cenſure of this graſs. It is an undoubted fact, that

that many parts of England would ſuffer infinitely, if the farmers were deprived of it; and ſome of thoſe parts are among the beſt cultivated parts in the kingdom. Ray-graſs is frequently ſown too thin: it is almoſt a maxim, that you cannot ſow graſs ſeeds too thick. If it is ſown alone, four buſhels an acre will not be too much: if with clover, twelve pounds of the latter, and two buſhels of ray-graſs will make a good covering.

Sheep.

This month moſt finiſh the feeding your ſheep on turnips: if they are kept longer on them, the barley or oat crop will be ruined, and but little good reſults to the ſheep; for the roots, after the ſecond branches are run, become hard and ſticky: ſo that no cattle, unleſs very hungry, will eat them. About the middle of the month, therefore, you ſhould manage to have the laſt of your turnips quite done, and put all your ſtock to cabbages, which are now in high perfection. The profit of this management cannot fail of being very great; for the difference of keeping your fatting ſheep, and ewes, and lambs, longer in a food grown very indifferent, and of which they are tired, or changing them to a freſh ſort in full perfection, muſt be prodigouſly great.

At this ſeaſon the ſtock, whether ewes, lambs, or fatting ſheep, muſt be kept extremely well. If they are pinched now, all the money before expended will be nearly thrown away. Turnips can no longer, with any propriety, be depended upon. If the farmer has not a great breadth of ray-graſs, or ſome other graſs, cabbages are his only dependence, and he muſt either poſſeſs a crop of them ready for this ſeaſon, or ſell off his fatting ſheep ſooner than he deſires, and ſtop the growth of his lambs, at a time when they ought to be half fat. By the middle of April, indeed the natural graſſes will afford a ſmall bite, but feeding them at that ſeaſon is abſolute ruin to the crop of hay.

In fattening wethers, the great object is to keep from ſelling, till the middle of April, then to begin, and keep killing

killing till the end of May, is the moſt profitable conduct; for the price a butcher will then give, much exceeds that o two or three months earlier. How advantageous, therefore to have a field or two of cabbages ready to take all the ſtoc by the middle of March from turnips; or if cabbages be th chief crop to have enough of them to laſt till May.

In the eating the crop, attention muſt be given to the ſoil: it is dry enough, they may be eaten on the land much bet than turnips; becauſe they ſtand above ground; but if th land is wet, they ſhould be cut and given the ſheep on a ſma graſs field.

Cows, &c.

Throughout this month, keep your cows lean, and your cattle cloſe to the farm yards: on no account let them wand over any of your fiels. If they even ſteal into a graſs fiel and it be a forward ſpring, ſo that they get a mouthful or tw of graſs, it will prejudice them not a little, for they will n be ſo well contented with their dry meat after: beſid they poach the graſs, and you loſe much manure; for th reaſons, it is very adviſeable to have all your yards (I ſuppo water to be in them) locked up, and then it will not depe on the memory of ſervants. Keep every place well litte with ſtubble, ſtraw, or fern: Remember that your omitti this attention will be juſt ſo much miſchief to all the cr of your farm in the article of manure.

At this ſeaſon, a farmer who has weaned any calves, ſho obſerve that they are well and regularly attended; th ſhould have a ſmall yard with ſheds to themſelves, and h their bellies full of the refuſe leaves of the cabbages given the milk cows, with whole ones if they were not ſufficie Young cattle ſhould be kept well, or they will come to a v poor ſize: their dry meat ſhould be good hay

The Teams.

A diligent farmer will now ſee to his horſes and oxen forming good days works. In ſowing time, he ſhould

let them work leſs than ten hours; but this he will not be able to effect, if the ploughman have to take care of their horſes. It is beſt to have horſe-keepers, for the mere attendance of the teams: ſo that the men, who hold the ploughs, may have nothing to do but the mere plowing. Let the horſe-keeper have the horſes fed and harniſhed ready for the ploughmen to be in the field by ſix o'clock: at eleven they ſhould come home for an hour and a half to dine and bait, during which time, the horſe-keeper is in attendance again. At half an hour after twelve, they ſhould go out again and work till half an hour after five, when the horſe-keeper ſhould again take the teams, By this method, a pair of horſes, in a well made plough will, without any driver, plow an acre and half very eaſily, and no object is more important than the plough's doing good day's work in the ſpring of the year. The conſequence eſpecially of making the moſt of dry weather in March is extremely great: one acre plowed and ſowed then may be fairly worth two that are left till the beginning of May. From long obſervation of the value of dry ſeaſons for tillage in this month, muſt ariſe the old proverb of "A peck "of March duſt is worth a king's ranſom."

Water Furrowing.

In all new ſown or plowed lands, as ſoon as a field is finiſhed, let the ploughs, before they leave it, ſtrike the water furrows, and ſend in men directly with ſpades to ſcower them, that is, throw out the molds; in all lands, ſown with with clover or graſſes among the corn, they ſhould be dug a ſpit deep, and the moulds thrown carefully out. Many farmers are not attentive enough to this point; they only ſcour the furrows; but they ſhould conſider how long the graſs is on the ground, which probably may be two or three winters; and conſequently it muſt be very material to the crop to lie dry all that time, which ſcowering alone will not effect.

ARTICLE XXVIII.

Of the culture of Potatoes —Two kinds of Potatoes recommended for Seed—Of draining Level Grounds.

[In a letter to the PUBLISHER.]

AGRICULTURE bringing more real riches to a kingdom, than the diamonds of Galconda or the gold of Peru; is it not then the buſineſs of the Legiſlature, to encourage and promote the ſtudy of that firſt of ſciences? The Farmer is the ſupport of his country: To defend and protect him is true Patriotiſm: To grieve at his proſperity, and regrete the conditions of his tack, is rebellion to our King, and a breach of the laws. I have ſometimes thought, that the knowledge of Agriculture, ſhould be taught in our Univerſities, and that a Profeſſor being inſtituted for that end, would be productive of the greateſt advantages; and if the uſefulneſs of the ſubject was laid before our beneficent Sovereign, every thing might be expected from his parental care.

Some time ago, I ſent you two eſſays, one on the culture of Beans, the other on Potatoes [VOL. I. p.334.]. To the firſt I have nothing to add; but ſome part of the ſecond, through the hurry of the corrector of your preſs, or my bad writing, is not ſo clear as it ought. In the planting the potatoes, I only use one line, marked at the diſtance of each foot; a man digs a ſmall pit oppoſite to every mark; a girl drops a plant into every hole; the line is then ſhifted, and placed at the diſtance of two feet, and the earth taken out of the pits in the ſecond row is put to cover the plants in the firſt, and ſo on through the whole field. In this manner, laſt ſeaſon, I planted fifteen acres, at the very moderate expence of eight ſhillings each acre. I know not a greater improvement in the Potatoe culture, than the digging them up with the broa-

toe

ed grapes; it is cheaper than taking them up by the low, and clears the land of the remaining root weeds, equally well with the moſt perfect fallow. I took up my whole crop in that manner, and my land left clean as I could wiſh.

I have tried many different kinds of Potatoes, but none rs in any degree equal to the Royal Forreſter, and Red-no-ed Kidney: I brought theſe two kinds from England, and an truly ſay, they exceed, by fifteen bolls on an acre, every ther kind I ever ſaw. They excell in taſte, as they do in num-er. By our carrier next week, you will receive a parcel of ach kind, to diſtribute amongſt ſuch of my brother farmers, s chooſe to call for them *.

In Article XX. of the firſt volume, you treat of water, s an impediment to vegetation, and mention, from Mr DICK-SONS's very valuable book, the method of preventing it, [VOL. I. p. 147.]; but as he only points out the way of doing o, when there is a declivity to carry it off, allow me to inform ou of a method I have found effectual, without any. In the farm I poſſeſs, different parts of the fineſt fields were rendered in-apable of bearing wheat, or early ſpring-corn, from the wa-er ſtagnating in the hollows. I had no declivity to carry it away. I tried to ſink it, and the method anſwered my moſt anguine wiſh. I knew the reaſon, why water lodged there, was owing to a clay bottom, below the ſoil, which prevented the water from draining off: All I had to do, therefore, was to find out in the field, a place neareſt to the ſtagnate water, where under the ſoil there was a gravel bottom; I then took the level of the place where the water ſtood, and dug a drain from it into that part of the field, where the bottom of the ſoil was gravel: at the end of the drain I made a pitt, and fil-led the drain and it up with ſtones, &c. as a hollow drain, in the

* Theſe two kinds of Potatoes, are received by the Publiſher, and will be delivered to any Farmer who pleaſes to call for them.

the ſame way you recommend [VOL. I. p. 150.]. It effectually anſwered the purpoſe; for thoſe parts of my farm, that before were in a manner uſeleſs from water, are now as dry as any other part of the field: The expence is trifling, in compariſon of the advantage. In this year I have ſaved more wheat than will defray the charge I was at four times over. Wiſhing ſucceſs to your laudable and moſt uſeful publication,

I am, &c.

RUSTICUS.

Eaſt Lothian,
March 11. 1774.

ARTICLE XXIX.

Cauſes of the Slow Improvement of Agriculture.

[In a letter to the PUBLISHER]

AGRICULTURE is an art which has been practiſed in every civilized country, for many ages, and by an infinite number of men: A few of them men of education and enlarged minds: A number of them men of ſufficient natural ſagacity and judgement to direct their conduct in other matters. It is an art, beyond all others, uſeful and important to the public; and every particular farmer has a ſtrong ſpur from his own intereſt, to follow the beſt and moſt profitable practices. When one conſiders theſe things, he might expect that this practical art would have mounted, long before this time, to its higheſt pitch of improvement, riſing ſtep by ſtep upon the firm baſis of the experience of ſo many ages; at leaſt he may wonder, that, after the infinite number of different trials, the diſcoveries have been ſo few, the improvements ſo ſmall and ſo ſlow, and that ſo many evidently abſurd and unprofitable methods of farming continue to prevail, in this, and in all other countries. This appearance has often ſtruck the writer of this letter, and doubtleſs many other thinking men

wers. He has thrown together a few plain obſervations, which will in part account for it, pointing at thoſe obſtacles to the improvement of farming, moſt general and extenſive in their influence: If his obſervations are thought of any conſequence to remove them, when they can be removed; to correct men's prejudices, lead them to a more rational and liberal way of thinking on this ſubject; and to quicken the improvement of practical farming in this country, which is the profeſſed object of your publication; you are moſt welcome to them: If they do not appear to have this tendency, they may be thrown aſide, without giving the ſmalleſt offence, I aſſure you, to the writer of them.

Agriculture, conſidered even as the buſineſs of the common farmer, is a more complex art, and conſequently more difficult in practice, than is generally imagined. The manufacturer, the common mechanic, the ſhop-keeper, perpetually poring upon the ſame objects, and repeating the ſame manual or mental operations a hundred times every day, may ſoon bring their reſpective arts to the utmoſt pitch of improvement of which they are capable. But the farmer, beſides his manual operations, has a more extenſive ſphere of action. A conſiderable variety of objects and operations come within the plan of every ordinary farm, and require both judgement and activity to conduct them properly. Beſides, the ſtate of his cattle and the various inſtruments of huſbandry; the variety of ſoils to be found in moſt farms, different in their quality, different in their ſtate, vigorous, exhauſting, &c. the different kinds of grain or graſs beſt adapted to theſe ſoils; alſo the variety of manures and different ways of culture; the quantity and quality of the ſeed, the proper times of ſowing, the timing all his other operations in ſuch a manner as to give the leaſt interruption to one another; the ſucceſſion or rotation of different crops; the climate, the changes of the weather and ſeaſons: Theſe, and an infinte number of other interfeering circumſtances, come within the conſideration of the farmer, and muſt be examined

and

and decided upon every year, for himſelf, in the beſt manner he can. To ballance and adjuſt all theſe things to one another, and to his own particular purpoſes, and to manage his farm in a proper manner on the whole, requires a degree of attention, judgement, and candour, ſeldom to be met with in thoſe who purſue this buſineſs for a livelyhood, and a degree of practical knowledge, derived from experience and patient perſeverance, ſeldom to be met with in thoſe who purſue it chiefly for amuſement. Hence the advantage of ſmall farms! Hence the yet greater advantage, of introducing judicious methods of farming into a country! Once fairly eſtabliſhed, they acquire an authority from cuſtom and example: the farmer goes on in the common rotine, as he ſees others do before him: he is ſaved much thought and contrivance: he is ſaved the exerciſe of his own invention and judgment, which is very troubleſome to many; yet he can never in this reſpect be brought upon the ſame footing with the manufacturer or the common mechanic. No offence, however, to thoſe uſeful men: Their induſtry is no leſs neceſſary to the welfare of the community than his.

But as cuſtom ſtamps a credit upon ſuch practices as are wiſe and uſeful, it ſtamps an equal credit upon ſuch as are leſs ſo; ſuch as, compared with the former, are abſurd and uſeleſs. Many practices in farming, that were, perhaps, judicious when they were firſt introduced, ought now to be given up, for others yet more judicious and profitable, and more adapted to the preſent improved ſtate of the country. Yet many who follow thoſe practices are unwilling to give them up. This looks like acknowledging themſelves in the wrong in their former conduct; and why will you be ſo reluctant to make ſuch an acknowledgement? It is only ſaying, that you are wiſer to day than you were yeſterday. Here, however, is another powerful obſtacle to the improvement of farming;—Prejudices, attachment to ſyſtems of it which men have embraced; it matters not much whether they be old or new ſyſtems. This, indeed, has given a fatal check to moſt attempts which

ave been made, to make men wiſer and better; it has been a eavy clog upon improvement, not only in farming, but in every ther art, in every ſcience, in philoſophy, in religion. I ſay, arrow prejudices, and blind attachment to ſyſtem, has ſhac-led the minds of multitudes of men, even in the moſt civili-ed countries, and kept them too long under the power of ig-norance and barbarity.

The lower farmers are attached to the ſyſtems of farming hey have received from their forefathers, ſanctified by anti-quity, and rivetted by cuſtom. Seldom will they be prevailed pon, to venture out of their own narrow circle, to depart rom the prevailing practices of the country where they live, o try the better practices followed in a different part of the ountry, or to try a hundred little experiments, which yet they ight do without any trouble or riſk. In this reſpect they ave been much complained of, and ſurely not without rea-on. For however natural and innocent their attach-ment to their old practices may be; yet it is the chief thing hich prevents the introduction of better practices; it is the hief obſtruction to the improvement of the country. The riter of this feels a ſincere compaſſion for this claſs of men. He is ſenſible that their attachment to their cuſtoms, is much wing to their narrow education, and unfortunate ſituation in ife. And without education, the ſtate of both the higher, and ower ranks of men, muſt have been much worſe than it is. But he cannot vindicate ſuch of them as ſtill continue to follow he prejudices of a wrong education, after they have had full pportunity of having them corrected. Had we followed the ootſteps of our forefathers in every thing, what would e have been at this day, but Heathens and Barbarians!

And why will men, to whom God hath given a portion of eaſon, follow any opinion or practice blindly, without giving hemſelves the trouble to think, whether it is right or wrong? Why will they continue blind, not only to reaſon and truth, ut to their own evident intereſt? Why, for inſtance, will they

they continue to plow and ſow their outfield grounds, when they themſelves acknowledge, that theſe grounds ſeldom compenſate them for ſeed and labour? Why will they refuſe to ſow their lying fields with graſs-ſeeds, when they cannot but ſee, that an acre, laid down in this way, goes further than two or three acres without it? Why will they continue to plow in ſome places with ſix, in others with four horſes, when they ſee before their eyes, that two horſes, at leaſt in all level grounds, will do the buſineſs equally well? Or continue to cultivate a rood, or half a rood of Potatoes with the ſpade, when they ſee that an acre or two can be done by the plough with a third part of the time and labour? It is not indeed to be wiſhed, that common farmers would take the lead in making new experiments, or introducing new practices. But when gentlemen of education, ſenſe, and candour, have done this to their hands, have brought the practices of experienced farmers in diſtant places of the iſland to their own very doors, and ſhown theſe practices to be unqueſtionably ſuperior to their own, by repeated ſucceſsful tryals; why will they not follow them? Nay, why will they behold them with the ſneer of ſtupid ignorance and bigotry, and treat them with ſcorn? When men continue in ignorance for want of the means and opportunities of better information, they are to be pitied and excuſed: but when the means of information are within their reach, before their eyes; to neglect them, to ſcorn them, to ſhut their eyes againſt the clear light, this is not to be excuſed in any ſet of men.

On the other hand, though the country is highly indebted to many gentlemen and actual farmers of a ſuperior claſs, who have, at a conſiderable riſk and expence to themſelves, introduced a more rational and ſpirited culture, than the common, upon their own farms, though we are much obliged to them for their many ſucceſsful tryals, and not a little even for their unſucceſsful tryals, and the inſtruction as well as warning we have derived from theſe; yet it is not to be diſſemble

ſembled, that a conſiderable number of them are under the power of prejudices, that the intereſts of practical huſbandry have ſuffered, and its improvement been much retarded by theſe. Farmers of this claſs, are indeed ſufficiently diveſted of the prejudices of education and cuſtom, from their hearing of, or ſeeing the different methods of farming, that prevail in different places of the iſland, and in this reſpect, have a great advantage above the ordinary farmer. But many of theſe ingenious cultivators diſcover themſelves under the influence of prejudices of another ſort, blindly attached to fanciful theories and ſyſtems of farming, which they have embraced from reading or converſation, and which they are exceedingly loath to give up. One of your correſpondents obſerves, with a mixture of ſimplicity and ſhrewdneſs to this purpoſe, for I cannot find the paſſage, That it ſeems to be their aim to teach farmers, not how to raiſe a good crop, but rather how God Almighty makes plants; a point which he juſtly preſumes they will not ſoon be maſters of. How much have we read and heard of the vegetable food and paſture, of fire and ſulphur, and oils, and ſalts, and nitre, and acids, and many other things exiſting in an inviſible ſtate, in the different manures we employ, in the different ſoils, in the air, and every where, entering from thence into plants, and promoting or obſtructing their vegetation. What, pray! can a farmer learn from theſe things, or from any reaſonings founded upon them? Not to ſay, how remote ſuch theories are from all the ideas of ſimple and illiterate men, it appears to me inconſiſtent with any ſound philoſophy, to mix chimiſtry and farming together, and to reaſon from the one to the other in the manner that is commonly done. The two arts are different in almoſt every thing. The proceſſes of the chymiſt, and the changes produced upon dead inanimate ſubſtances, by mixing, compounding, and decompounding them; and the ſecret wonderful proceſs of na-

ture, in the nouriſhment, growth, and life of a plant, have ſcarce any thing in common; ſo that no concluſions can be drawn from the one to the other, of much conſequence to a farmer. Take a piece of bread or fleſh, put it into a retort, extract its oils, and ſalts, and earth, and water, and fixed air, and every thing elſe contained in it; and after you have deſtroyed its ſenſible qualities, try if you can diſcover by this means, whether it will be palatable to the taſte, wholſome or hurtful to the ſtomack; and will you ever by the ſame means diſcover, what is nouriſhing or hurtful to plants, about which, after all our ſearches, we ſtill know much leſs than about the human body.

Ingenious men have certainly a right to amuſe themſelves in any innocent manner they pleaſe; and when beyond amuſement, they think themſelves proſecuting ſome point of importance to mankind, much more are they entitled to purſue their ſpeculations to any length, even though they ſhould deviate never ſo far from truth and nature. Yet it is a little unlucky, when profeſſing to inſtruct men in a practical art, they happen, with the very beſt intention, to miſlead them,—to lead themſelves and their followers into ſchemes, uſeleſs, expenſive, hurtful to their fortunes, and to the intereſt and reputation of the art! When, for inſtance, they teach the farmer to throw aſide, in a great meaſure, his ſeeds and his manures, and to truſt entirely to culture, to ſow only a very ſmall part of his beſt cultivated fields with wheat or barley, to continue his culture ſtill at a high expence, and after all to expect a profit equal or ſuperior to what would have ariſen from ſowing the whole field! Yet I believe, the moſt romantic flights of the drill huſbandry have turned out in the end to the advantage of agriculture, by teaching ſober farmers a leſſon which they would not have learned ſo ſoon, even to apply this high culture, along with manure, to ſuch roots and plants as it is really adapted to, and where it brings a conſiderable profit. Yet in proportion as men are fond of any particular theories or

ſyſtems

ſyſtems of farming, their notions and their practice will be confined within this particular tract: Facts and appearances, which ſupport this favourite theory, will be eagerly attended to; while numberleſs other facts and appearances of nature, in this extenſive field of knowledge, will be in a great meaſure diſregarded, and few trials or diſcoveries made from them. And indeed it is to be regretted, that while the common farmers are attached blindly to the old ſyſtem of their fathers, many of a ſuperior rank and education ſhould attach themſelves too fondly to new theories and ſyſtems; and but a few of both be found, ſo humble and ſo candid, as to ſubmit to learn, from the ſimple and ſlow, but the only ſure guide to knowledge, even an attentive and patient experience.

As farming is entirely a practical art, conſiſting of a collection of experiments or diſcoveries made at different times and in very diſtant ages, the experiments in it are more tedious and precarious, and conſequently the concluſions drawn from them more uncertain, than in any other art: And this is another cauſe of its ſlow progreſs and improvement. Every experiment or trial in agriculture takes a ſeaſon at leaſt. Every farmer muſt wait ſo long to ſee the effect of his trial: Nay, he muſt often wait for ſeveral ſeaſons, to ſee the full effect of ſome manures, of a proper rotation of crops, and of many other important trials in the courſe of his buſineſs. This requires patience and perſeverence. It requires alſo a great accuracy of judgment to know the effect of his experiments, to make proper deductions, and to draw juſt concluſions from them. For all concluſions in farming have a conſiderable uncertainty in them; becauſe the ſucceſs of every experiment depends, in a conſiderable degree, upon the ſeaſons, the weather, than which nothing can be more uncertain; and upon a variety of other cauſes and circumſtances, which have an influence on the crop; ſuch as the ſeed, the quality of the ſoil, manure, culture, the beneficial or hurtful influence of the former crop. Theſe different cauſes are always combined together; they act

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in conjunction, in producing the ſingle effect; and it is impoſſible for the moſt experienced farmer, to aſcertain their influence ſeperately, or their different proportions to one another; that is to ſay, it is impoſſible for him to know for certain, to which of thoſe cauſes the ſucceſs or the failure of his crop was owing, and how far each of them operated in concurrence with, or in oppoſition to the reſt. Every one knows, that the effects of lime, dung, and culture, are very different upon different ſoils, in a wet or dry ſeaſon, on clean or foul, on freſh or worn out grounds. The effects of lime, dung, and culture, are probably much greater when combined, than ſeparate; theſe cauſes aſſiſting one another: On the other hand, it is probable, that ſome manures and operations in farming counteract one another.

The ſeaſons alone have ſuch an influence, that the beſt judges are tempted ſometimes to cry out, That good weather is all in all to the farmer. How different the produce of a hay or paſture field in a cold and dry, or in a warm and wet ſeaſon! Here no other cauſe ſeems to operate, but this great cauſe. Yet a dry and warm ſoil, ſuppoſe a perfect ſand, by cauſing the graſs-ſeeds to ſpring early and cover the ground, will raiſe a prodigious crop of hay in a dry ſeaſon, and counteract the influence of a ſevere drought, which will ſcorch the crop of hay on a colder and later ſoil, and make it worth nothing: An effect which an unexperienced farmer would ſcarce expect from ſuch a cauſe beforehand. And though in crops of grain the influence of culture and manure does in ſome ſort counteract the unfavourable influence of ſeaſons, yet they cannot render the farmer or his crops independent of them. But as the ſeaſons are the ſame to all; will not a well manured and cultivated field always yield the beſt crops? It has doubtleſs the beſt chance. It will generally do ſo. But if, inſtead of a general, you make an univerſal concluſion in its favour, and expect it will always do ſo, this expectation will be contradicted by experience. When the later end of the ſeaſon is

warm

warm and wet, (and we had a courſe of ſuch ſeaſons two or three years ago) the fields, under the higheſt culture and manure, will ſuffer moſt from the lodging and rotting of the weighty crop, and yield a produce inferior to fields under a lower or more ordinary culture.

But the produce on the ſame field, manured and cultivated in the ſame manner, varies; not only from the general quality of the ſeaſon, dry or wet, cold or warm, early or late; but much more from what we call in Scotland the tid, the particular fortunate ſeaſon when the ſeed is ſown and harrowed, the ground plowed, or any other important operation performed. And perhaps the chief ſuperiority of the good to the bad farmer is, that the former times his operations in ſuch a manner as to be able to catch theſe tids, and make the moſt of them. Yet this is often not in his power entirely. When the ſeed is ſpringing, it is then in its moſt tender ſtate, and probably more affected by the weather, than afterwards. The ſeeds of the annual weeds, from which not a thouſand part of our grounds are ſufficiently cleaned, are in the ſame tender ſtate with the grain: and whether the grain or the weeds will prevail, depends chiefly on a fortunate or unfortunate tid at ſowing, and for a month after. The ſhooting of the wheat, barley, and oats, and the flowering of beans, peas, and potatoes, ſeems to be another critical ſeaſon, by which the crop will be much affected. Fifty other uncertainties or variations from cauſes, beyond the knowledge and power of the farmer, might be mentioned.

The reſult of theſe obſervations, is not, that we ſhould turn ſceptical in this important branch of knowledge. By no means: but only, that we ſhould be ſlow, cautious, and careful in our concluſions.—That no general concluſions ſhould be made from particular experiments in huſbandry, till theſe experiments have been repeated often and often in different circumſtances, and the effects attentively obſerved by an accurate and candid mind.—Another thing follows from this obſervation

joined

joined with the firſt, that it is not ſo eaſy a matter to be a good farmer as is generally imagined. It is impoſſible to ſtart into the knowledge, much leſs into the practice of it, all at once. Let no young practitioner however, let no gentleman be diſcouraged from the attempt. He may ſpend his money perhaps more agreeably, but he can never ſpend it more innocently, and more uſefully to the public; and if he ſtrikes into a proper tract, I will venture to ſay, more profitably to himſelf. No ſolid knowledge of any kind can be acquired, no valuable acquiſition made, without labour and difficulty. He wants experience. Yet if he has attention, good ſenſe, and candour, he will ſoon acquire it. With theſe qualifications he will gain more practical knowledge and experience in a few years, than the ſtupid or prejudiced farmer will gain through the courſe of a long life. Let him not truſt his own theories and fancys, or thoſe of others. Let him try all things and hold faſt that which is good. Let him truſt rather to the judgment of the wiſe and experienced farmer. In this walk of life, they are generally abundantly communicative of their knowledge, and of the grounds of it. But how ſhall he know the beſt and moſt experienced, when he is without experience himſelf? Nothing is more eaſy. The tree is known by its fruit. The beſt farmer is always, he that raiſes the beſt and moſt profitable crops.

Another great cauſe of the ſlow improvement of farming, is the want of attention to local and peculiar circumſtances. All good huſbandry is local, or ſuited to the place where the farmer lives, to the climate and ſoil which he enjoys, the access he has to manures of different kinds, the market or demand he has for the product of his grounds, and fifty other things which are peculiar to his ſituation, and ſeldom concur in any other ſituation. The times of plowing and ſowing the grain he raiſes, the culture he beſtows, and many other parts of his management, muſt be regulated by theſe. As to climate, whatever difference there may be upon the continent

do not apprehend the differenee ſo great in different place of our iſland as is commonly repreſented. Potatoes thrive admirably in our cold climate, yet I have been aſſured it is impoſſible to raiſe them by any management in the happy climate of the ſouth of France. The climate of the ſouth of England may be ſo far ſuperior in point of heat, as to bring ſome plants and ſeeds to a perfection, which they cannot be brought to, in the northern parts of the iſland; yet, in general I would not incline to lay ſo much ſtreſs upon this ſingle point, as ſome judicious and experienced farmers ſeem to do. There is little ground to think, that the climate in the Eaſt and Weſt of Scotland is ſo different, as to dictate a different time of ſowing, or a different kind of huſbandry, graſs and tillage huſbandry, on the two ſides of the iſland. A courſe of wet and dry ſeaſons makes a far more material odds to farmers, both in the Eaſt and Weſt, than any ſmall difference of their reſpective climates; and from any obſervations I have been able to make, the ſeaſons, whether wet or dry, cold or warm, are very ſimilar in their general courſe all over the iſland. Let any one, who has kept a regiſter of the weather, compare the ſeaſons in Scotland, during the 1763, 1764, 1765, 1766, and 1767, with the notes of the ſame ſeaſons in the South of England, found in Mr Young's experimental huſbandry, and he will be convinced the difference is very inconſiderable. The greateſt difference I have ſeen in this point is, that ſome climates are more cold and ſtormy, or rather ſome ſituations more expoſed to ſtorms, than others. The wiſe farmer will adapt his ſeed and other parts of management to this. In oats eſpecially, there is a great variety of different kinds, and ſome of them much more fitted to bear rough weather than others.

The ſoil is another local circumſtance, which calls for a much greater variation of management from every judicious farmer than the climate, and will oblige him to purſue a plan of manure, culture, and crops, not only different from his neighbours, but different from himſelf, I mean a variety of plans, ſuited

ſuited to the variety of ſoils in his farm. Yet how little va-
riation is commonly made in the application of manures and
culture, to the different ſoils of a farm! The only variation
attended to is, in the ſeed or grain; and even in this men ſuf-
fer themſelves to be guided more by a blind attachment to
eſtabliſhed rules and ſyſtems, than by fair trial and experi-
ment. It is an eſtabliſhed maxim, that beans will only grow
on a ſtiff or clay ſoil. Such a ſoil, under good manure and
culture, I take upon the whole to be the beſt of all ſoils for
them. Yet I have ſeen many clays where they will not grow at
all. Beſides, it is ſometimes, often indeed impoſſible to throw
them into a clay ſoil ſo early, as to ſecure a good crop. Rus-
TICUS ſays, and I can ſay the ſame from experience, that good
crops of beans may be raiſed on any ſoil in heart, except grave
or ſand. [Vol. 1. p. 247.] Look into the garden, and ſee what
crops even of the largeſt kind can be raiſed upon almoſt every
ſoil. Many Scots and Engliſh farmers mantain, that barley, and
bear which they call big, will anſwer equally well on the ſame
ſoil, with the like culture and management, and that the laſt
being an inferior grain, ought to be baniſhed from the ground
of every good farmer. The concluſion would be juſt, were the
fact true; but our common farmers know, from trial, that it is
not. I myſelf have fondly attempted to raiſe barley for many
years, and could ſcarce ever attain to a middling crop; yet,
the ſame ſoil and ſeaſon, with leſs manure, have raiſed very
great crops of bear; and there are ſoils near mine little dif-
rent to appearance, where barley will grow in perfection.

It has been ſaid, that the ſoil and climate of the Weſt of
Scotland is unfavourable for wheat. I believe this prejudice
has prevented ten thouſand trials of it. I believe alſo, that
our ſoil in general is not ſo rich as the ſoil of the Eaſt. Yet
we can produce old rentals, from which it appears, that many
chalders of wheat were annually paid to Monaſteries, three
or four hundred years ago. We can raiſe, at this preſent time,
very good crops of both winter and ſpring wheat. Yet are

ther local circumſtance is a ſtanding diſcouragement to the ulture of this beſt of all grains, there is no regular market or it, and few milns being as yet erected in the Weſt by ublic ſpirited gentlemen, the farmer lies much at the mercy f the baker in the ſale of it.

How favourable are ſome ſoils, beyond others, for graſs eeds? There are many clays, and alſo a few light dry ſandy oils, where ſcarce a ſtalk either of red or white clover will row, with any poſſible manure or culture.

But why do I wander into ſuch a detail? The point I meant to lluſtrate and inculcate was, That all judicious and good farming uſt be local; That the good farmer is obliged to adapt his ſeed, ulture, and the whole plan of his management to the variety of is ſoils, and to many other peculiar circumſtances in his ſitu- tion, which have not been enlarged on; That this variety or iverſity of ſoils and ſituations is great and endleſs, and there- ore, no general rules can be laid down in this art, at leaſt ery few, which will ſuit every particular caſe; no general lans of culture and management, which will anſwer you, or me, or any other farmer in his practice: You may divide his oil into clay, and loam, and moſs, and gravel, and ſand, and ifferent mixtures of theſe, and give him good rules for the anagement of each of them; but his clay, and loam, and and, may happen to be exceedingly different from yours: And he never can know the nature and quality, or rather the ffects of his ſoil, by looking at it, by its colour, appearance, eeling, by any chymical experiments upon it, or rules laid own beforehand, to diſtinguiſh it from other ſoils. He muſt ry it as a farmer, in his own way, and ſee what it will do, hat it will bear, what grain, manure, and culture, will beſt a- ree with it, and form his own plan of management accor- ingly.

But does not this cut down the utility of all books and inſtruc- ion on this important branch of knowledge, and of the Scots

FARMER among the reſt, and reduce the whole art to mere ex
periment, what ſome will call mere quackery? I am ſo far fro
thinking inſtruction uſeleſs to the practical farmer, that
think he has more need of it than moſt other men. An
there are few books, except ſuch as are wrote by mere the
oriſts whoſe farms are confined within the bounds of the
paper or their chamber; I ſay, there are few books, where th
inſtrumen's and operations of huſbandry are deſcribed, plai
rules laid down, and the experiments, the foundation of the
rules, detailed, with any proper accuracy and candour, fro
which the moſt judicious and experienced farmer may no
draw ſome hint, ſome inſtruction, that will be uſeful to him i
his own practice. And I ſupport this aſſertion, and reconci
it with what was formerly ſaid, by obſerving, that though i
all farms there is an endleſs diverſity in ſome circumſtance
yet there is a great ſimilarity or ſameneſs in others; and whe
ever a farmer finds, not from theory and fanciful gueſſes, bu
from actual trials, his own ſoil and ſituation ſimilar, or nea
ly ſimilar to that of any other more judicious farmer, he ma
derive much benefit from his more enlarged knowledge and e
perience. The perſonal experience of every actual farmer i
and muſt be, very limited. How few the trials he can mak
himſelf, compared with the infinite number of trials tha
have been made? And what an advantage to him muſt it b
to have his own prejudices corrected, his knowledge an
experience enlarged, by that of others ſuperior to himſelf, i
attention, in judgement, in fortune, in the means and oppo
tunities of acquiring knowledge? Though he may be ſo vain a
to think his own knowledge ſuperior to theirs, in ſome, pe
haps in many points; yet it will be ſtrange indeed, if they a
not able to give him inſtruction, in other parts of this exte
ſive art, with which they are better acquainted than he
ſtrange, if ſomething or other in their management and pla
may not be adopted by him, as an improvement of his ow

or accommodated with ſome ſmall change to his ſituation, or may ſuggeſt ſome uſeful hint, or put him upon ſome trials that may lead to a diſcovery of ten times more conſequence to him, than any trifle of money, time, or thought, he may throw away, in the peruſal of their writings. But they may miſlead him. Yes, they may. Yet he has chiefly his own ignorance and raſhneſs to blame, if he follows any wrong ſcent. Why will he not make due allowances for their prejudices and miſtakes? Reject what is fanciful: Neglect what is uſeleſs in itſelf, or uſeleſs to him: Select what is likely, upon trial, to prove uſeful, profitable, and proper to his peculiar ſituation; and, like the bee that gathers ſomething from every flower, gather ſome new light, ſome inſtruction and experience, from every quarter.

On the other hand, if any perſon ſhall fancy, that reading or converſation with intelligent farmers, will ever make himſelf a farmer, without practice; if he ſhall obſerve the rules given him, and adopt the plans of management that have been ſucceſsfully tried, by the lump, and adhere to them, invariably, expecting the ſame ſucceſs, without regard to his own different ſituation, he will be miſerably diſappointed. But if he compares the climate, ſoil, and ſituation of other farmers with his own, tries their plans with proper alterations and deductions, where the circumſtances are not ſimilar, and tries them at firſt with caution, and upon a ſmall ſcale, where the circumſtances appear moſt ſimilar, and the proſpect of ſucceſs moſt flattering, and adheres only to ſuch parts of them as will ſtand the touchſtone of his own trial and practice: ſuch a farmer will find the experience and obſervations of others, of uſe to himſelf, in a thouſand inſtances, both in the way of warning and inſtruction. His own candid judgment and experience is however the main guide, you ſee, he has to truſt to, without which, he can make no good uſe of the experience of others, nay, in many caſes will be much hurt by it.

This

This leads me to mention one other thing, which has much retarded the improvement of farming, even that farmers are at no pains to collect and record their own experience, or the reſult of it, with any ſort of accuracy; the conſequence of which is, that in a few years, it is almoſt forgotten, even by themſelves, and much more by others. Suppoſe a farmer has ſufficient ſagacity, to ſee his own, and his neighbour's blunders, and attempts a better practice, in ſome inſtances, yet the ſucceſs or failure of his attempt he does not ſufficiently remember and build upon in future trials, ſo as to make it the foundation of a further and further improvement. If indeed his ſucceſs has been remarkable, he continues the practice for a few years; till a ſucceſſion of two or three unfortunate ſeaſons, or ſome other croſs accident, makes him weary of it, and fall back into the rotine practice of the country.

If farmers go on, like their cattle, in the beaten track of the country where they live, it is of no conſequence to themſelves or others, whether they record their experiments or not. For they are only ſuch experiments as have been made again and again, a hundred thouſand times, and the reſult of them is fully known. But there are many gentlemen, and a few actual farmers, who have a proper portion of the ſpirit of diſcovery and enterpriſe, who do not confine themſelves to any beaten track, either old or new, but ſee much room for improvement, and are not afraid to attempt it, wherever they ſee an opening that leads to it. It were much to be wiſhed, that ſuch farmers would take the trouble, chiefly for their own ſakes, to keep ſome book, or regiſter by them, and mark in it the quantities of grain, ſown and reaped, upon all the different incloſures in the farm; the times, and any other material circumſtances, reſpecting the tillage-huſbandry. This could be done with the leaſt trouble imaginable, upon half a ſheet of paper, divided into columns, in the following manner, or

n any other more regular and perfect manner the farmer may ontrive at his leiſure.

Grain	Quan. of ſeed bolls B.	Ground acre R.	Sown	Reap.	Stack.	Threaves	Produce Bolls buſh.
Wheat	2. 1.	B. A. 2. 1.	Oct. 1.	Aug. 25.	Sep. 5.		20. 2. nearly
Barley	3		Apr.				9. per acre.
Siberian Barley			Mar.				
Beans							
Oats, &c.			plant.	howed	digged		
Potatoes			Ap. 1.				
&c. &c.							

In the firſt column to the left hand might be inſerted the uantity of ſeed. In the ſecond column the initial letters of he park or incloſure, together with the extent of the ground pon which it is ſown in acres and roods. In the third the me of ſowing. In the fourth the time of reaping. In the fth the time when it was carried into the barn or ſtack; and his, compared with the former, ſhows how long it ſtood in he fields, according to the favourable or unfavourable caſt of he harveſt. The ſixth column the number of threaves. nd the laſt column the produce in bolls, with room to ark the proportion of this produce to the ſeed, or the acre, or ny thing elſe worthy of note. The farmer has no more to o, but to fill up the columns of ſowing, reaping, &c. the me day the fact happens, and he has before him at one iew the moſt material circumſtances of his tillage huſbandry. le might, if he pleaſed, inſert two other columns, exhibiting he number of plowings given to the field, and the carts of me or dung, &c. laid upon it.

Another page of his book might exhibite the ſtate of his y and paſture encloſures, for which three or four columns ight be ſufficient. Another larger ſchedule might exhibite a very ſmall compaſs the winter tranſactions.

The different mows or ſtacks 1ſt, 2d, 3d, with the number f threaves contained in each, might be ranged below one a- other, like the wheat, barley, and two lines drawn from them

to

to the end of the page, in which every quantity thraſhed from them might be inſerted as ſoon as it was meaſured, and when the ſtack was finiſhed, the total carried forward to a column on the right hand of the page.

I only ſuggeſt theſe things to the actual farmer, unexperienced in book-keeping, to ſave him the time and trouble (as his time is often precious) of minuting his various and complex tranſactions every day in a journal as they happen, which I know ſome judicious farmers do, and ranging them afterwards in a regular book. But by recording them at firſt in this regular manner, or according to any other more perfect ſcheme which might be eaſily contrived, he may comprehend all that is neceſſary to be remembered by himſelf in two or three pages, and this at the expence of the twentieth part of the time and labour neceſſary for the other.

But beſides this, every farmer, who has got any education above the common, will find it uſeful to keep ſomething like a journal, conſiſting of a few jottings, if it were but once every week or fortnight when he is moſt at leiſure, particularly ſome account of the weather, not for every day in the year, which would be uſeleſs to the farmer whatever it might be to the philoſopher, but as it runs in courſes of weeks, fortnights, months, &c. dry, rainy, ſtormy, froſty, warm, cold, variable, &c. together with any thing remarkable in the courſe of the winds as connected with the weather, or any thing remarkable in the riſing and falling of the barometer (if he has one) whether the changes of weather from one ſet to another does not fall out a day or two before or after the new or the full moon, which will be found generally the caſe. Or if they be connected with any other ſigns known to himſelf or his neighbours in the part of the country where he lives. The effects of the weather upon the graſs or grain ought to be carefully obſerved and noted.

But much more ought the farmer to minute his principal operations in the field, any thing worthy to be remembered during

during the courſe of the year in his management of his different ſown fields, the manure and culture beſtowed upon them, the time this was done, the effects of it, how far it has anſwered his own expectations, the moſt probable cauſes of his ſucceſs, or want of ſucceſs, that, if they depend on himſelf, they may be repeated or avoided in the next trial, eſpecially in any new experiments he makes. The whole neceſſary operations ſhould be minutely deſcribed, the expence of them calculated and fairly ſtated, and the ſucceſs or failure, the profit or loſs on the whole, faithfully recorded.*

The trouble that ſuch a regiſter will coſt any perſon who has learned the uſe of his pen is next to nothing. The advantages of it, at leaſt if his farm be at all an object worth his attention, are many and great beyond what he can imagine without the trial. It will give him an eaſe, order, and accuracy in this buſineſs, which it is impoſſible he can have without it. It will in moſt things be an effectual check upon thoſe under him, or with whom he has any dealings, by rendering him, not only equal, but ſuperior to them in their own buſineſs. Accuſtomed to habits of attention and accuracy, he will acquire in a few years a facility and accuteneſs of judging, even with his eye, in the moſt material articles, which they will not acquire in their careleſs inaccurate way, through the whole courſe of their lives. And if any young farmer thinks he has little uſe for ſuch an acquiſition, and expects at preſent in this walk, the *Neſcia fallere vita* which Virgil pictures as a characteriſtic of it in his time, I ſhall only ſay, that he may happen to be diſappointed.

Let me add, as the main purpoſe for which I recommended this practice, that it is the ſhorteſt and ſureſt way, perhaps the only way, to arrive at that practical knowledge and experience in

* The writer of this has kept ſuch a journal, rather more full and accurate than here deſcribed, for eleven or twelve years paſt, and he has often regretted he did not begin it much ſooner, even as ſoon as he began farming.

in the art, which is of more conſequence to his ſucceſs than all other qualifications put together. How is it poſſible he can gain much knowledge or experience, if he has no diſtinct views of the reſult of his own experiments or trials; if he only makes gueſſes, often wide of the mark, and does not aſcertain them by number, weight, and meaſure, and remember them afterwards? How is it poſſible he can know the different ſoils or qualities of his grounds, and the different grains and manures beſt adapted to them, if he does not aſcertain the quantity and value of the different crops growing ſucceſſively on the ſame field, by a fair compariſon; and alſo the comparative expence of the different manures or culture he beſtows upon them?—But I am aſhamed to inſiſt on ſo plain a point: The utility of the practice will be acknowledged by all. And yet, through I know not what infatuation, if it is not the infatuation of indolence and careleſſneſs, it will be followed by few. Let theſe few go on however to ſtate, every year, the principal facts and circumſtances of their farms before their own eyes, and they will find themſelves acquiring a facility in this difficult and complex art beyond their hope, growing wiſer every year, both by the errors and ſucceſſes of the former year, learning many leſſons, catching many hints which would have otherwiſe entirely eſcaped them, that will be of great uſe to them in their future practice: And let them if they pleaſe compare the reſult of their own experience and practice, with that of their friends in the ſame walk of life, for they will probably think them unworthy of the public view: A few ſuch regiſters, kept in a particular diſtrict where the ſeaſons, ſoil, and other circumſtances were near ſimilar, and compared together, would ſuggeſt ſome general rules and maxims, and lay the foundation of a more judicious and ſucceſsful practice in that part of the country.

The above is what has occurred to me, as to the moſt general cauſes of the ſmall and ſlow improvement of huſbandry. The letter has ſwelled to twice the length I intended: Perhaps you and your readers may wiſh the thoughts had been contai-

contained into a narrower compaſs; yet there is no writing intelligibly on a general ſubject, without running into a detail, and touching ſome of the moſt important particulars, to which the general obſervations and reaſonings are applicable, and what appears tedious and trite to one, may be uſeful and abſolutely neceſſary to make the thing underſtood by another. There are many other more particular and local cauſes of the ſlow improvement of farming in Scotland; ſuch as, The high rents, in moſt places quite beyond all proportion to the preſent ſtate of improvement in this country; The ſhortneſs of our tacks. Both theſe, inſtead of being a ſpur, are a wretched clog upon the induſtry and ingenuity of the farmer. Why ſhould he labour beyond what is abſolutely neceſſary, when he has ſcarce any hope of reaping the fruit of it?—The iſſue of our tacks, at a preciſe and certain, inſtead of an uncertain, term.—The poverty of the greateſt part of our tenants, which incapacitates them for any vigorous and ſpirited efforts at the beginning of their leaſes. When the tenant has a ſmall ſtock, and is at the ſame time induſtrious and intelligent, the maſter ſhould bear ſome proportion of the expence of any judicious improvements, and at the ſame time make the rent up in ſuch a manner as to pay him 6 or 8 *per cent* for the money he lays out, during the tack of which the tenant reaps the benefit, and the additional value of the ground at the end of a nineteen years tack, will more than indemnify him for the ſunk capital—The largeneſs of our farms, almoſt all of them too large in proportion to the ſtock and induſtry of the tenant; the outfield ground eſpecially, is a dead weight upon him, and in moſt caſes he would be better quit of one half of it. Theſe, and many other obvious cauſes, I have ſaid nothing of, becauſe they are already

treated of with great juſtice and delicacy in the Introductory Eſſay to the SCOTS FARMER *. [VOL. I. p. 1.]

* The writer of this letter, as far as he knows, is an entire ſtranger to the writer of the eſſay he refers to, and indeed to all the managers of the Scots Farmer, except five minutes converſation he had with the Publiſher. He thinks himſelf therefore at liberty to expreſs his opinion of that introductory paper, as a piece of compoſition that does honour to the SCOTS FARMER, by ſtanding at the head of it, and does much honour to the genius and humanity of the writer of it. He wiſhes to ſee his pen employed oftner than he thinks it has yet been, during the courſe of this publication. With reſpect to the hiſtorical part of that Introductory Eſſay, he begs leave to obſerve, that there is good ground to think there was a period of improvement in Scotland, which, though a ſhort one was ſuperior to any former or ſucceeding one, except the preſent. It was during the Uſurpation of O. CROMWELL, and continued to ſome years after the Reſtoration.

During the civil wars in England, it is more than probable that many Engliſh families retired from the ſcene of confuſion and bloodſhed in their own country, and ſettled in the low country of Scotland, which continued in tranquillity, except the ſingle and ſhort ſhock given by Montroſe's army. But during the reign of the Protector, an Engliſh army lay in Scotland, ſometimes to the number of many thouſands, every common ſoldier of which received his regular pay of 8d a day. This poured a flux of money into the country. Farming was then in a low ſtate in England, but in a ſtate lower in Scotland; for however rapidly we follow them at preſent, we were then more than a century behind them. The Dutch and Flanders huſbandry was introduced into their gardens and parks, and their fields were under much higher cultivation than ours. And is it to be thought, that our farmers would learn nothing from the Engliſh yeomen, which chiefly compoſed CROMWELL's army, and were men of the ſame ſober and religious

It would gratify many of your readers, if, beſides Mr Dickson's directions which are excellent, ſome of the managers

eligious caſt with themſelves? But the point does not reſt on conecture; it is ſupported by many facts. The old rentals of ſeveral ſtates in the Weſt ſhow, that many farms were ſet higher during at period, than they were 30 or 35 years ago. The large fines acted and paid by country gentlemen, and their tenants, during e ſucceeding reign, comparing the value of money then with its reſent value, would almoſt tempt one to think, that both were in a ealthier ſtate at that time, than ever they have been ſince. There a tradition that can be depended on, however incredible it may em, that in three pariſhes in the Weſt there were many ploughs orth 1000 merks. They plowed at that time with 6 horſes, and e breed of work-horſes had been much improved by a great imortation from Denmark by King James VI. There are parts large incloſures ſtanding at this day, made by Cromwell's ſolers, ſtone-dikes near ſix feet high over tracks of country; many ſtiges of old incloſures in the common way; attemps made, to ain lochs by long and deep canals, at a great expence; and many her marks which it would be tedious to mention, of a ſpirit of provement, which, I have no doubt, began to ſtir during that riod, and even roſe to ſome height. But the ſucceeding ſcenes on obliterated the very memory of theſe things. The dreadful exions, impriſonments, and other oppreſſive meaſures purſued by oſe in power, equally contrary to ſound policy, as to juſtice and manity, not only impoveriſhed, but even deſolated large tracks the low country of Scotland, eſpecially the weſtern counties, ve the indignant gentlemen, and many of their wealthy tenants dependants, in crowds, into Ireland, England, Holland, and oſt every foreign country, and extinguiſhed any ſparks of the it of induſtry and improvement in the breaſts of thoſe who e left behind. A ſucceſſion of five or ſix years of dearth, ſoon er the Revolution, completed the ruin of this miſerable country; hat it was not till many years after the Union, that the face of gan to change.

nagers of the Scots Farmer would take the trouble to give us in a few pages, the result of Mr YOUNG's experiments on wheat and barley in the broad cast way, as contained in different places of his experimental husbandry; that is, to give us in quarters and bushels the produce and profit of two or three of his best, as many of his middling, and of his worst crops, with the expence of manure and culture per acre, and the same of beans, peas, oats, potatoes, carrots, clover, and saintfoin; also the result of his experience with respect to the time and quantity of seeed. I mean, that you should inform us in a sentence or two, what he judges from tryal to be the most proper time of sowing wheat, barley, beans, &c. &c. and to be the most proper quantity of seed per acre. It would be obliging, if any of your correspondents would account for the fact, that barley is sown very early in England, and very late in Scotland.

Feb. 8th, 1774. TITYRUS

THE SCOTS FARMER,

MARCH 1774.

ARTICLE XXX.

On Hay Harveſt, and the Hay beſt adapted for that purpoſe.

ADDRESSED TO THE

KILBARCHAN FARMER SOCIETY.

NEIGHBOURS,

I Wrote you about a year ago, upon the difficulties, and management of a Bad Harveſt. I did not, at that time, think of the Hay Harveſt. As you, however, are entitled to every hint which I can give, for your benefit, I hope you will accept of this, as a ſupplement to my former letter, and a new mark of my attention to your improvements, through whatever channel it may reach you. I would be fond, of being more generally uſeful to my country; but I am afraid of going beyond my depth. I know your cuſtoms, and am every day forming ſchemes to improve them: Should I attempt to write more at large, there are many places in Scotland, ſo far beyond us in culture and management, as might lead them to neglect any cuſtom of yours, or hint of mine.

When I write to you, my Friends, of Hay Harveſt, it muſt occur to you, that we have two-ſeaſons, which will paſs here by that name. The *firſt* is, the ſeaſon in which we cut and make our ſown graſs hays: the *ſecond* is, that in which we cut and make our meadows or bog-hay, about a month or more after the former.

We begin with the ſown graſs. And here, as it is not only an object of public curioſity to know the different cuſtoms of Scotland, but particularly neceſſary, in order to underſtand any provincial writing, I ſhall take notice of the ſtate of your huſbandry in the Weſt, with regard to ſown graſs.

Many of you, my Neighbours, ſow only ray-graſs upon your grounds; ſome, with more foreſight, add a few pounds of white clover. The firſt only is intended for your hay crop; the ſecond is deſigned, after the ray-graſs runs out, to ſward your grounds with a better graſs than what the ſoil perhaps would produce of itſelf. For in your light grounds, you have great dependence on your milk cows and young cattle. If you are poſſeſſed of a deep and rich ſoil, it is not uncommon for you to ſow from ſix to perhaps ten pounds of red clover. Even from this addition you do not expect much increaſe to your hay crop, unleſs the ſeaſon has been favourable. But when the clover thrives, the after math is very great, ſometimes think ſuperior to your firſt cutting. This however is commonly paſtured in the later end of the year, when the natural graſs fails: Or, which is much ſafer for black cattle, and equally beneficial for horſes, it is cut and carried green into the byre or ſtable. If it cannot be all overtaken in this way a certain portion of the field is made into hay for immediate conſumpt, after the green feed is gone: for it can ſcarce be dryed for keeping, unleſs it is mixed with the ſtraw of oats or barley; a cuſtom which you have not yet adopted.

This, I imagine, may give a ſufficient general notion of your practice in the Weſt, with regard to ſown graſs. In other places the management may be different. It is common in England, and the Eaſt of Scotland, to ſow large fields of red clover alone; perhaps chiefly as a preparative for future tillage. Indeed, ſome of our graſs fields in this neighbourhood have been broke up with great ſucceſs, in the very luxuriancy of the after-math. But this practice has not as yet got into common uſe.

I have been indeed told long ago, that the ray-graſs had loſt its reputation in England; and therefore, if their farmers deſign to lay down a field for continuing in graſs, they uſe the natural graſs-ſeeds rather than any other. Indeed, upon their plan of huſbandry, this may be requiſite, to make a thick and laſting cover to the ground. Their conſtant croping of their grounds for many years together, with the intervals of ſummer fallowing and hoeing, may deſtroy ſo effectually the natural graſs, as would leave very little cover on the ground, when the ray-graſs and clover wears out. It is not ſo with us. Though upon the introduction of clover and ray-graſs, ſome of our gentry ſpared no coſt, not even a ſummer fallow, to produce clean and large crops of hay; yet they have not been imitated, nor have they themſelves perſevered; though nothing pays a fallow better than graſs, or ſuch ſmall ſeeds. Our grounds are therefore in general laid down foul enough; which allows the natural graſs to take place, ſooner ſometimes than we wiſh for it. I am therefore inclined to continue the uſe of ray-graſs, with a mixture of red and white clover. Theſe do very well with us for a crop or two of hay; and I ſee no great need for our being at great pains, in collecting the natural graſs-ſeeds, even for our grounds that are to lie, till our better culture ſhall make it more needful than it is at preſent.

When a particular practice depends upon a variety of circumſtances, in any plan of huſbandry, it is improper to make partial encroachments on it, unleſs we mean to reform the whole.

I have however another, and a more important end in view, when I wiſh to continue the ray-graſs in uſe, preferable to red clover, or natural graſs: It is eaſier to make than any other hay whatever. In all our Engliſh writers, I obſerve, they find greater difficulty in managing their hay, than any other crop; at leaſt they expreſs more anxiety for good weather at that ſeaſon, than any other. This has oft amazed me, who, living

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in an unfavourable climate, never found difficulty, nor felt anxiety on that account. I have been therefore ready to impute their difficulties, either to bad management, or to a too great attachment to red-clover alone, or to natural graſs enriched and ſoftened with dung; both which are more difficult to manage than if it were ray-graſs, or ray-graſs with a ſmall mixture of the clovers. A courſe of twenty years experience, without the leaſt loſs or hazard, either of hay or ſeed, entitles me to ſay ſo much; and to recommend both the ray-graſs and the following method of managing it.

But before I enter upon the management itſelf, in regard to the influence that hearſay and prejudice have upon many in your rank of life, I cannot conclude this recommendation of ray-graſs, without taking notice of one objection againſt it; which is, that it wears out the ſoil as much as any corn crop does. But, having heard the objection near twenty years ago, and with this addition to give it weight, viz. that it had been long made againſt it in England itſelf; I then inſtantly reſolved to be at a point with it: Having therefore the year before cut off an acre of ground from a neighbouring field, for the purpoſe of trifling experiments, I now put it to this uſe. I ſowed both the field and it with ray-graſs and clover, upon a ſimilar dreſſing: I cut the field but once, and paſtured it for three years more: I cut the acre all the four years ſucceſſively: And when on the fifth year, I broke up both for tillage, I found the oats equally luxuriant: I even found my fourth crop of hay, upon the ſingle acre, not much diminiſhed from the former crops, as the natural graſs ſupplied the gradual decreaſe of the ray graſs and clover. And my only inconvenience was, that the ſuperior proportion of natural graſs incommoded me a little in that management, which I mean to recommend. From this trial I was ſufficiently certified, that, in my light ſoil at leaſt, there was nothing worth my care in the foregoing objection. One indeed has reaſon to ſuſpect, that faſhion, the moſt capricious of all tyrants, may get into our huſ-

husbandry, as well as our dreſs. The honeſt farmer, therefore, has equal reaſon perhaps to guard himſelf againſt the fondneſs for novelty and change; as againſt the bigotted attachment to old cuſtom.

As I obſerved formerly, that there are ſeaſons for hay harveſt; ſo, to my leſs attentive neighbours, I here obſerve, that there are two ſeaſons for cutting ray-graſs itſelf: which, if they can help it, they ſhould never ſuffer to be confounded. There is firſt its virgin ſtate. For if they intend the field or any part of it for their own conſumpt; or even, if they do not like the appearance of mixture in the ſeed, and incline not to have it, the hay ſhould be cut, when the field is generally in bloſſom. I think it a loſs to myſelf to delay the mowing beyond that period. For if the ſeed is once impregnated with the meal of the flower, it comes on ſo faſt in that ſeaſon, that the hay itſelf is apt to ſpend too much of its virtue in ripening and filling the ſeed: And the ſeed, which, had it remained in the ſtraw, was alone able to have ſupplied that waſte in the hay, is apt to be ſhaken off in the handling and uſing of it. A prudent farmer, ſays Mr TULL, ſhould never ſuffer any of his early cutting to go to market; both becauſe it ſhould give him a great deal of oats, and, at the ſame time, it will not in the market bring him a price proportioned to its intrinſick value, or to the value of the ſeed which he ſacrificed to obtain it. I have conſtantly kept this virgin hay for my own uſe, and have learned, from experience, to eſteem it beyond my thraſhed hay.

The ſecond period of cutting ray-graſs is, when its ſeed is juſt ſo ripe as not to ſhake off the ſtraw, till it is thraſhed in the field. For here the intention is to ſave the ſeed as well as the hay. The rule which I firſt obſerved, for judging its ripeneſs, was, biting the ſeed through with my teeth, in different parts of the field. But I was taught an eaſier and equally certain method of aſcertaining the ripeneſs, by an Eaſt County Farmer that long reſided in the Weſt: and to this ingenious

nious man, I owe much of the little knowledge I have in works of huſbandry. When the field was dry, he took off his hat, and ſtruck the edge of its crown againſt the growing ray-graſs; and if five or ſix ſeeds fell into the bottom of his hat, it was then, he ſaid, ready for any three or four days continued work. This rule I have found from experince to be ſure enough. For if the weather is good during that time, the ſeed will be generally, about a fourth or fifth part heavier, than what we get from England; which is the medium of ripeneſs that I think ſafeſt upon the whole. If it is too thin and light, it will not vegetate ſo uniformly: If it is too full and hard, it cannot without loſs be handled at all. And whatever others may think, my opinion is, that ſome little nicety in attending to the above particulars, is of ſome conſequence; for if I have not been oft miſtaken, many pounds have been loſt on ſeveral fields, within my obſervation, by ſuch as deſpiſed the attention requiſite.

As the management for ſaving ray-graſs hay is the ſame whether it be cut in its virgin ſtate, or when the ſeed is ripened; we ſhall follow the ſteps uſual in the laſt caſe, which will include the thraſhing operation.

The firſt work is mowing and lap-cocking, both of which are performed in one day; and, with reſpect to any part of the field, nearly in one minute.

The ſecond work is thraſhing and tramp-rucking, which are alſo performed on the ſame day. And I will venture to ſay that as the hay is in a ſtate of abſolute ſafety, from the time it is put in lap cock, and for ſeveral weeks afterwards; ſo may alſo affirm it is in equal ſafety, for months, from the time it is put in tramp-rucks. And, if there is not a minute loſt between the cutting and cocking, and there needs not an hour be loſt between the thraſhing and rucking, I cannot ſee how there can be any riſk of the hay; unleſs a bad day is chosen for theſe ſeveral operations, and the work itſelf continued under the very rain.

For the lap-cock operation, it is neceſſary to provide every pair of ſcythes with three followers, boys or girls from fourteen to eighteen or more years. Two of them are employed in cocking, and one of them is employed in raking between the cocks.

The manner of conducting the whole is as follows: After the mowers have got about ſix yards of ſwath, ſo as there can be no danger of hurt from the ends of their ſcythes, the cockers begin; firſt by gathering up in their arms as much of the ſwath as will make a cock, following ſideways after the mowers as they gather it; then they ſhake it into a heap, as neatly as they can, upon the end of the ſwath where they left off gathering. This they do chiefly with one hand, or if both are employed, it is done alternately, all along endeavouring to make the ſtraws fall acroſs each other, that they may bind the maſs together every way. This heap the cocker preſſes down quickly, but gently with one hand, and immediately graſps the whole to her boſom, turning both ſides away from her at the ſame inſtant. This poſition being ſecured with one hand, the other is employed in folding over the upper edge of the heap in the ſame manner: and this poſition being alſo ſecured as above, the looſe hand is employed in folding back a part of what hangs downward, which reduces that lower ſide to the narrowneſs of a tail; and this at laſt is alſo folded under the cock, as it is laid upon the ground; for the cocker ſteps backward, drawing that narrow tail along the ſtubble, and even binding it by a gentle preſſure on the ground, as the cock is laid down: And this finiſhes the operation of lap-cocking.

The lap-cock has five folds, and when well made, it has the appearance of a round ball, flattened a little beneath. It may be about a foot high, and eighteen inches broad. If it aſſumes a oval figure, there is no great matter, as the end of it will always ſtand to the wind. But this ſhape is acquired by giving too little preſſure in laying it down, which does not bind in the tail

tail enough; and therefore it may be eaſily corrected at plea-
ſure. The croſſing of the graſs ſtraws on the ſurface, gives it
the appearance of net-work, or rather of an old faſhioned
warp-clew, before the babbins were invented for warping;
only with a third part cut away, for a flat ſide to ly upon.

If in ſhaking the hay at firſt upon the heap, both hands are
employed together, without ſufficient care to let the whole fall
upon the center of the heap, then it makes two little hillocks a
top, which, after they are formed into a cock, are apt, for
want of ſufficient cohéſion, to ſeparate, and let the rain into
the heart of the cock. If the ſtraws of graſs fall not in a croſs
direction, but rather in parallel lines, the ſame effect follows;
it is apt to open, or to let down its out ſides (eſpecially if not
folded up lightly) in the form of a tea-cup, turned down upon
a tea ſaucer. Theſe appearances are ugly, and their effects
bad; for the rain gets either into the cock, or into what I
called the tea ſaucer, which by lying flat upon the ground is
ſoon blackened; or if the drought continues, it is parched and
diſcoloured, by having too much ſurface expoſed to the ſun.
Laſt of all, from ſome of the foregoing cauſes, ſometimes the
ends of the upper ſtraws ſtart up, and lye flat upon the head
of the cock, like an old faſhioned ſtraw-hat; and the firſt
puff of wind blows them off. If this appearance diſcovers it-
ſelf immediately, the cocker whips it off, and carries it on to
the next cock; but if this is not done, it ſpoils the look of the
field, and ſome ſmall part of the hay. Let the cocker there-
fore ſhake the hay well, and with one hand at a time, mov-
ing ſoftly half round the heap, and backwards to her place
during the ſhaking; in order to make the ſtraws croſs each
other in all directions, as they fall: Then let her graſp and
fold it up lightly, and preſs it to its roundneſs, as it is laid up
on the ground: And thus the work is done in taſte, and with
good effect. The operation, like every other manoeuvre, may
ſeem tedious in the deſcription; but, when learned, the exe-
cution is inſtantaneous.

After this account of the lap-cocking, nothing more needs be ſaid, but that the work be carried on after the mowers to the end of the ſwaths; and if any thing is left there, let it be raked to the ſide of the growing hay, where it will be taken up next time. The raker, as he follows the cockers, ſometimes gathers a little heap before him; but this, when it begins to be bulky, is taken off his hand by the neareſt cocker, and ſo carried on to the next cock. So that if a clean place is choſen to ſet down the cocks upon, and the raker is dextrous in cleaning the places, the field is left perfectly neat, without any thing to hurt the eye. It is even pleaſant to ſee, with what regularity and activity the work goes on, every one puſhing another. The mowers are loth to be overtaken, and therefore earneſtly puſh forward: Their followers, loth to be left behind, hurry after them; ſometimes alſo running backwards the whole length of the cutting, that they may enjoy a minute's reſt, while the ſcythes are a ſharpening. Nor does the labour thus divided, ſeem to be in the leaſt diſproportioned, unleſs the graſs be very thin. Then indeed the mowers and cockers have it in their power, to run away with the work, and leave the raker; but, for this reaſon, the ſtrongeſt and nimbleſt of the followers, is commonly put to the rake; or they take it by turns, to lighten the heavy burden.

When ray-graſs hay is put up in this faſhion, it will endure long continued rain, without being hurt. I have had it under fourteen days and nights rain, without the leaſt loſs. If the farmer will take up a well made cock, half an hour after a heavy ſhower, he will be convinced, when he finds how light and dry it is. The moment therefore that his field is cut, he is at eaſe for a time, being almoſt aſſured of finding a good day for thraſhing it, before it can run any hazard.

In the mean time, if the weather be favourable, and his field open to its influence, the farmer may take up his virgin hay, in five or ſix days from the cutting, and put it in ramp-rucks, of a hundred or a hundred and twenty ſtone.

And no other preparation is neceſſary for this, but to turn up the lap-cock bottoms before breakfaſt, if thoſe parts ſhould have got a dampneſs from the ground, with which they were in contact: and even this precaution is chiefly neceſſary, after the ground has been wet ſome time, or the rucking delayed beyond its uſual term.

That field, or part of the field, which was reſerved for ſeed, may, in favourable weather, be taken up out of the lap-cocks in four or five days after cutting; provided the thraſhing be performed in the field. Nor is it even neceſſary, when the thraſhing goes on immediately, to turn up the bottoms in the morning: For if the day itſelf is good, the airing which they receive in carrying, thraſhing, ſhaking out the ſeed, and in the whole work of rucking, is fully ſufficient to take off any coldneſs contracted by lying on the ground. But, if late rains have made it neceſſary to turn the cocks, the farmer muſt himſelf judge of this; and the operation is by no means tedious.

You have now, my good Friends, been witneſſes to the lap-cocking near twenty years in this neighbourhood; yet you have not generally followed the example. Some of you continue to ſpread out your hay to the ſun; others of you ſhed and ſtook what you deſign for ſeed, as you do your corns; and though we have converſed ſometimes upon this ſubject, yet hitherto we have none of us convinced another. I would therefore beg your attention to the few following remarks upon theſe cuſtoms.

The cuſtom of ſpreading out hay to the weather in the dew time, and gathering it up at night, till it is well; though too generally practiſed in England itſelf, I muſt diſapprove of in every view which I can take of it, ſave one; and that when the intention is to leave the ſeed upon the ground, in order to thicken the crop next year. The proverb indeed ſays "Make hay while the ſun ſhines." But if the maxim is taken literally, it is ſeveral ways pernicious. The apothecary

who means to preſerve the good qualities of his medical herbs, dries them in the ſhade, and would eſteem them loſt if expoſed to the ſun but for a day. Is it then poſſible to expoſe hay to a hot ſun, for two or three days, without evaporating moſt of its good qualities? It is ſcarcely to be thought. If on the other hand, the weather ſhould happen to break while the hay is thus ſpread out, pray what becomes of the hay-maker, not to ſpeak of the hay? I need not deſcribe the miſerable wretch, or paint his ſituation: He himſelf muſt feel it. If he intends to thraſh the hay, made in that faſhion for ſeed; why, it is gone. Let him but weigh, and examine the rakings of a field, and then he will know, what effects the dragging of his hay through a cloſs ſtubble muſt have upon it. I never could rate the loſs of ſeed in this way, at leſs than thirty ſhillings an acre: and if the farmer can count, that is at leaſt thirty pounds ſterling, upon a twenty acre field. I am aſhamed to ſee this money thrown away, by ſuch as can both think and figure. Were this ſum ſtollen from them, would they not regret the loſs, and reſent the injury? The only apology that I can make for them is but a poor one; having never perhaps received money for graſs-ſeeds, they are not in uſe to value that article, as they do other grain. I have even known the virgin hay itſelf ſuffer in the ſame manner. For though it is not deſigned for thraſhing, yet is it often cut ſo late, as to have much of its ſeed ripened, and ſhaken out by the above management. Had it been preſerved upon the ſtraw, its own good quality might have compenſated that waſte, which the hay made of itſelf, in producing and filling it. The laſt objection which I have againſt this method of making ray-graſs hay, is its attendance and expence. Indeed nothing can be more fatal to the farmer, than his being at double expence in retaining a pernicious, or even a dangerous cuſtom; when he might have adopted a cheaper, ſafer, and better. If farmers however will ſuffer their ray-graſs ſeed to fall upon the field, whether by negligence or deſign, I

could

could wiſh they were prepared to adopt the improvement, celebrated by Mr YOUNG, upon the Marquis of Rockingham's farm; which is, to give the field a top dreſſing from the manhill, above the ſhaken ſeed. This might aſſiſt it to vegetate, and both thicken the graſs, and improve the ground for a ſucceeding crop. But until we are more in uſe of preparing ſuch dreſſings for our grounds, it will be our advantage to take care of our ſeed for the market.

The other method of winning ray-graſs hay, is bundling it up in ſheaves, and ſtooking it, as we do corn. This method is only uſed when we deſign it for ſeed. I muſt indeed own, that the ſtooking of ray-graſs will preſerve it a long time from the injuries of the weather. But as it cannot ſo ſoon prepare the hay as the lap-cock, it muſt run a greater riſk of meeting with ſuch injuries, during the long time it is out. As was obſerved to you in my laſt, the oats, which are ſmall in their ſtraw, and full of graſs, are the moſt difficult to win. So I now obſerve, that the matter is not much mended, when the whole ſheaf is graſs, even though it be ray-graſs. Accordingly, I have ſeen ray-graſs ſtooks, ſtanding on ſome fields to the weſt of us, long after the corns about them were reaped; and I have ſeen them ſo much blackened in their colour, that I could ſcarce tell what was on the field, till I drew very near, and knew the ground by the ſtubble. Nor do I mention this diſagreeable appearance, as a ſingularity; It has many times occurred to me, and as oft pained me. I am at a loſs to account for the long continuance of this practice, in a neighbourhood that has as long preſented objects of a better oeconomy. I have indeed been told by ſome, that they can ſell their hay as dear as I can mine; and when I urge this point, they ſay, perhaps truly, that there are ſome innkeepers not ſo fond of the hay which horſes are over fond of. I hope there are few ſuch, if any at all; for I ſhould be ſorry, if the ſloth of one ſet of men received protection from the infidelity of another. Sure it cannot be the caſe in

great

reat towns, where gentlemen, who love their horſes, will huſe the beſt hay for them, as well as the beſt accommodation for themſelves. Others indeed candidly own, that being ccuſtomed to the practice of binding and ſtooking, in which, ith proper attention, they have hitherto been ſucceſsful; hey cannot give themſelves the trouble of introducing the ap-cock method among their ſervants; eſpecially, as they apprehend it to be no cheaper than their own. To ſuch I would nly obſerve, that if two mowers at 1 s. 6 d. each, and three ockers at 6 d. each, will finiſh two acres a day, at 4 s. 6 d. can ſcarce conceive a cheaper method of working as much round; eſpecially if both hay and ſeed are ſecured by it. I ave indeed no perſonal experience of the method of binding, nd ſtooking after the ſcythe: But, from what I have geneally ſeen of this practice in other hands, it appears to me, that reater hazard is run, and more labour beſtowed upon it, han in the lap-cock way. I do indeed remember, to have enuired into the expence of reaping corns by the ſcythe in ngland, above ten years ago; with intention to have introuced the practice here, if I found it advantageous: and by l the information I could receive from our travelling chapen, who I found had been ſtruck with the novelty, and d even enquired into the expence, I never could make it leſs an four ſhillings the Scotch acre, or the five roods Engliſh; hich is near double the charge of lap-cocking. At preſent, hen I ſuppoſe two ſcythes, and two Scots acres wrought, an yet bring it no lower, conſidering the number of follows, and the nature and expence of their work. Such of my ighbours as have given occaſion for this minuteneſs, can ſurely l, upon due reflection, what is the real expence of binding d ſtooking ray-graſs: And if they find it greater than what ave ſtated the lap-cocking, they will both be ſo candid as own it; and ſo prudent as to deſert a loſing plan, and even honeſt as to gi ve one example more of a better oeconomy.

The

The only objections worth notice, that have occurred to me, againſt the lap-cocking, are two.

The *Firſt* is, That it expoſes a great deal of ſurface to the ſun; which in clear weather ſome think may diſcolour it. This however cannot be compared to the ſcorching which it gets, by being ſpread out, and turned up on all its ſides to his beams. For here the whole effort ſeems to be, to burn up every ſtraw. Nor do I think it comparable to the long time in which it may ſuffer the ſun's influence, while in the ſtook. For, if it is conſidered, that, in fine weather, hay for feed ſeldom lies in the lap-cock above four or five days, and that the ſun beams do not penetrate beyond the outſide, while all within remains perfectly green; one might venture to ſay, without experience, that the hay cannot be hurt. This indeed is the truth, and the firſt trial will confirm it. No method preſerves the colour better then the lap-cock; for when it is mixed by the thraſhing and ſhaking, the niceſt eye cannot diſcern upon it the leaſt mark of ſun burning.

The *ſecond* objection is, that the lap-cock is not fit for all ſorts of hay. Well, and what if it ſhould not? ought it not therefore to be uſed where it will anſwer? In this view ſure it was, that I recommended ray-graſs with a proper mixture of clover, as what we might infallibly depend on, with the lap-cock management. But not to ſuffer you to cheat yourſelf out of a good practice, from imagined difficulties; allow me to add, that if you heſitate on account of too great a proportion of red clover, or of natural graſs; you have no more to do, but to ſuffer it to lie in the ſwath, where it is ſafe, for a day or two: and with this ſhort interruption, the lap-cocking may go on as before. This I have often done with good ſucceſs. Laſt of all, I can aſſure the public, that I have ſeen the ſofteſt graſs perfectly made by lap-cocks, even in thickets and cloſe places; and that only by making them of a ſmaller ſize, and ſuffering them to lye a ſufficient time. I have even employed them for winning ſhort peaſe, with excellent effect. A

ave therefore frequently wiſhed, to have carried the uſe of hem into the common meadows. But my own meadows eing made up, in ſome places of ruſhes and ſpritts, which ere too ſtubborn for that work; and in other places of ſuch hort ſoft graſs, as would not be made to ſtick together in a all, I was obliged to give up the ſcheme for myſelf. I ſtill owever, would recommend the trial, to ſuch of my neighbours s can better practiſe it.

It is now time we were thraſhing out our ray-graſs ſeed, you are not already wearied with what is paſt. But having een at full pains to fix the capital point, the remainder may e ſhortened.

After the ray-graſs cocks, intended for thraſhing, have been xpoſed four or five days in good weather; or if bad weather as fallen, and delayed the work, then, on the firſt good and romiſing day that caſts up, I prepare for thraſhing in the eld.

Thoſe who have convenience within doors, and perhaps ne for thraſhing without, carry their hay to the barn; and ere thraſh it at leiſure. But if I can find a good day, at any me within three weeks of the lap-cocking, I prefer the field, the following reaſons.

1ſt, A clear good day greatly aſſiſts the thraſhing work, and ntributes alſo to mend every part of the hay that needs dry- g. 2dly, I chuſe to keep all my barn room for ſpreading out feed, nothing being ſo much in danger from heating as w thraſhed hay ſeed. 3dly, It is an eſſential part of my plan, the management of all ſorts of hay, to keep it ſometime in mp-rucks without, before I carry to the ſtack-yard. There ive it the ſweat, that is both ſo neceſſary to its future ſafe- and alſo contributes to give it that ſweetneſs and tenderneſs ich makes all cattle ſo fond of it, and to thrive ſo well up- it.

Theſe

Theſe particulars may receive ſome further illuſtration, in the courſe of what follows.

For the thraſhing work we provide (or borrow) four or five ten feet planks, upon which it is performed: under theſe is laid the largeſt winnow cloth that can be had; and if the wind favours, we lay them commonly a-croſs a furrow, in order to contain a greater quantity of ſeed before removing them. Upon the windward end is laid another winnow cloth, or two coarſe bed ſheets, upon which the lap-cocks are thrown, as they are brought in to ſupply the thraſhing floor. On the leeward end is laid a third cloth, upon which the ſeed is ſhaken out of the thraſhed hay, after the flails have driven it down the wind, to that end of the thraſhing floor. For about four acres of hay ground we provide two thraſhers, with two or three flails lying by them, in caſe of their breaking thoſe in uſe. It would not be convenient for eight or ten people to wait the mending of a flail. We have one woman on the wind end, to ſupply the floor with unthraſhed cocks, another ſtrong one on the lee end, to ſhake the hay, and throw it well back behind her, till the tramp-ruckers can begin. We have alſo four more boys and girls, that are employed to carry in the cocks, and to rake the field. Each of theſe are furniſhed with a horſe ſheet, a courſe table cloth, or any thing proper to carry the hay, and prevent the ſeed from loſing by the way. When it is not too ripe, there is not ſo much need of theſe clothes. While the carriage is from the moſt diſtant parts of that portion of the field allotted for the floor (for the field is divided into three portions) all the four are employed in ſupplying the floor. As the diſtance begins to diminiſh, one of them takes a rake, to clean what is cleared of the cocks: and thereafter another goes to the raking, as the diſtance is ſtill leſſening. And the matter may be ſo managed, by an attentive maſter, that the whole of the firſt portion may be finiſhed at once, by the time of breakfaſting. Then all hands are hurried, in filling up the ſeed into ſacks, which is carried home by the houſe ſervant

they go to their breakfaſt; and ſpread upon the barn floor ithout delay.

After breakfaſt, if there was not leiſure before it, the cloths nd planks are removed to the moſt convenient place, in the econd portion of the field. There the ſame operations are rried on, till it alſo is cleared. And the ſame are likewiſe peated after dinner, till all is thraſhed that was allotted for e day.

If the farmer has not ſeen it neceſſary at breakfaſt-time, to ovide hands for the tramp-rucking; before dinner he muſt a judge, how far his own people ſhall be able to accompliſh againſt the evening. He may therefore in that interval, if thinks fit, call in the aſſiſtance of a neighbour or two; to gin the rucking for his evening ſecurity. At the ſame me, it is ſurpriſing what work will be done in an hour at ght, by a number of hands properly encouraged, and wiſely ſtributed, when you depend upon them for it. Every far- er knows how ſmall a trifle will gratify, and nothing more eds to be ſaid upon that head. My method of diſtributing hands is this: While the men fill up and carry home feed, the women and boys are ſent back to the firſt made ap; where they begin in two parties to lay the foundation two tramp-rucks, in the lee ſide, for the convenience of king up the hay. When theſe rucks grow to a height, and gin to be difficult for the young labourers, the men come d take them off their hands, in order to compleat them; ile the young ones go on to begin another pair. Thus a od number of hands, that otherwiſe might confuſe and in- rupt each other, do wonderfully well when properly diſtri- ted, and animated.

In this manner, a four acre field employs the firſt day, four
mowers, and ſix cockers; at the expence of L. 0:9:0
And it employs the ſecond day two thraſhers
at one ſhilling, ſix young people at ſixpence
each; amounting to about 0:5:0
If we ſhould allow for extra-work in rucking, or
increaſe of wages, about 0:2:0

The amount for the whole, is only L.: 16:0

I ſhould think it could ſcarce coſt more, unleſs the crop is very weighty, when an advanced price will not be grudged. I even think the ſecurity, which the farmer may enjoy, in this courſe of management, worth a great deal more to him than the money itſelf.

The ſeed and chaff carried into the barn, is ſpread upon the floor the firſt night. Next morning the ſtraw is riddled out of it; and it is laid out again; the farmer throwing it into ridges, as the maltſter does his bear from the ſteep. At evening, he runs the barn ſhovel through every ridge, to change the places of both ridges and furrows: and this he continues to do alternately every twelve or twenty four hours, as he ſees occaſion; till he chuſes to chaff and clean his ſeed. If he values his chaff, he needs not be in a hurry to ſeparate it from the ſeed, as both alike require to be fully dried for keeping. After he puts them through his fanners, if he is very nice with his ſeed, he may let the ſeed down in a ſoft wind, between two doors; where, by the aſſiſtance of both his ſight and feeling, he can ſeparate the fat graſs, and thin tay-graſs, to what extent he pleaſes. He muſt employ his ſmall ſieves, to take out the gooſe and point graſs: the ſeed of which may be either thrown to the chaff; or made to ſerve for a feed of oats, when the labour of the horſes is but light.

Many of you, my Friends, are fond of ſaving (as you call it) the field thraſhing and tramp-rucking. You therefore carry your ſeed hay to the barn, to be thraſhed there at leiſure. I have already

already given my opinion, and reaſons againſt this conduct: and only add now, that ſuch of you, as think houſing and thraſhing within a ſaving to you, would only conſider, that what you carry to the barn comes again, and begins to ſweat; in which ſtate it is very difficult to thraſh it well. If it is reſerved for a leiſure, that is a wet time, it can only increaſe the difficulty, and inflame the charge. If the continued goodneſs of the weather makes you forget your barn work; or if you put it off intentionally, till the ſweat be over; you have a chance of being encumbered with it at an improper time. And to crown all, perhaps you run the hazard, with ſuch a bulk of hay together, and in ſuch cloſe confinement, of over-heating it to a degree of rottenneſs. Look then before you, my Friends, and be not fond of ſaving one day that will coſt you ſix, and perhaps the value of forty. There is no oeconomy in that conduct.

To all the prudent my advice is, to thraſh their ray-graſs hay in the field, if they can: and that (tho' there was no other reaſon for it) for the ſake of its ſtanding ſome time abroad in tramp-rucks. There, as I obſerved, it ſhould have its ſweat, if one would afterwards be ſecure with it. When I recollect, what I have both read and heard from England, about the pains of their farmers to have their hay properly ſweated, (for nothing elſe will ſell in their markets,) and when I conſider their difficulty in governing that proceſs in the ſtack, I cannot but recommend the field tramp-ruck, beyond all other ſecurities. For in a ruck of about 100, or 120 ſtone, I am certain of heating it properly; and if I find it to be overdoing itſelf, I can check it where it ſtands, without anxiety, or trouble; and that only by raiſing any part of it with a common lever, and caſting what air I pleaſe into it. Indeed, in nine of ten inſtances, I ſcarce have found more requiſite, to bring the hay of rucks into proper temper, than barely to do, what every farmer, who keeps his hay, muſt at laſt do; and that is only, to carry it from the rucks in the field, to his barn-yard, and there to ſtack it up for good: for one clear day, with the repeated forkings,

and the ſpreading of it on the ſtack, is ſufficient to cool it. If more is ever needful, it muſt have ariſen from a blameable precipitancy in rucking or ſtacking. Were hay in any danger in the lap-cock, there would be ſome excuſe for haſtening the rucking: Were hay in any danger in the tramp-ruck, there would be ſome excuſe for hurrying it into the ſtack. But the ſecurity in both theſe ſtates is ſuch, as ſhould lead no man into any blameable raſhneſs, but ſuch as cannot enjoy their own quiet.

Small rucks, intended for keeping hay any time abroad, I abhor, and muſt condemn. Nothing keeps hay worſe. They either ſink down into a flatneſs, or are toſſed over with the wind; ſo that I have ſeen them to the weſtward, lying more like a muck heap, than a hay quoil; and that full two months after the hay had been made. They are often the reſult of making hay in the ſun-ſhine. Huddled together in ſmall quoils, at Even rain comes on, and wets them thoroughly; and there they lye, waiting till heaven work a miracle for their recovery.

We ſhould now take a ſhort turn with the farmer to his meadow grounds. After what has been ſaid upon the tramp-ruck, I need not follow him into his barn-yard. He has managed his rucks ill, if they do not ſuperſede all future care, even of his ſtack itſelf, except to put thatch and ropes upon it. If any thing however was needed here, enough has been ſaid in our former letter, to direct the ſtack yard management.

Of the Meadows.

One rule, which I invariably obſerve upon my ſpritty bog is, to cut it two or three weeks, before my neighbours cut theirs. Inſtead of waiting from week to week, till it thicken more at bottom, or lengthens out an inch or two more at top, I truſt ſuch additions to the after-math. I am particularly fond of having all hard and courſe hay cut in its greateſt and tendereſt ſtate. Indeed my whole effort afterwards is, to preſerve tha

that greenneſs and tenderneſs, by retaining almoſt all its juices. For this purpoſe, I ſuffer it to lye in the ſwath to dry, two or three days: and I find by experience, that it will, in that ſtate, keep better under the wetteſt weather, than in any ſmall quoils. Then, pulling out as many of the ſtrongeſt ſprits and ruſhes, as are neceſſary for ropes, and even for thatching itſelf, I turn over the ſwath, as whole and unbroken as I can: where it again lies ſometime, till I can put it in good ſizeable hand quoils. I never ſpread out, or turn it more; unleſs a ſtorm has diſcompoſed, and wet my quoils. I manage it therefore chiefly by turn quoiling; in which operation, two or three little quoils are put together, into one of a larger ſize. And by repeating the ſame operation, it gets at laſt into tramp-rucks: and there it ſtands to ſweat, for two or three weeks, till it can be ſafely carried and ſtacked.

Hay never, in my opinion, runs much riſk, but in ſmall quoils. And this, when it happens, is corrected, only by throwing down a little of their tops, or, if the ground is wet, by pulling out a little from the edge of their bottoms: and this may be ſpread out, an hour or two before the turn-quoiling. But even this ſmall riſk does not pleaſe me. To avoid it therefore, I would wiſh to introduce the lap-cock among thoſe of my neighbours, whoſe meadow hay will admit of it. It could be done, as was hinted before, by delaying the cocking for a day or two after cutting the hay, and by making the cocks ſmaller than was directed for ray-graſs. But if farmers are unwilling to go to ſchool in their old age, or if they are never hurried with changeable weather, ſo that they have not time to put their hay together, either in good hand quoils or lap-cocks, they might try another freſh cuſtom, of greater expedition than the lap-cock, and of better ſecurity than the hand quoil. It has this advantage to recommend it, beyond any thing quite new and ſtrange, as the ſervants may have practiſed it among other uſeful frolicks. For it is no other than rolling up the ſwath, as children do a ſnow ball: which may be

be done, to any bulk that the preſent ſtate of the hay will admit of, from two to three feet diameter. I have often tried it with ray-graſs by way of experiment: and have found it to keep the hay perfectly well that was rolled up dry, ſo long as I had occaſion to have it in that form. No rain indeed penetrates it to hurt it; ſo that unleſs it lies till the natural ſap over-heats it, I imagine, it cannot otherwiſe be hurt; nor would I much ſuſpect the heating itſelf. But having only made a few balls by way of trial, which generally went up into the tramp-rucks, with the reſt of the lap-cocks around them, my proof of them was not, as I remember, above eight or ten days ſtanding; from which I myſelf can pronounce nothing abſolutely deciſive.

I am,

My good Friend,

Yours to ſerve you,

Renfrew-ſhire,
March 7th, 1774.

ARTICLE

ARTICLE XXXI.

THE FARMER's KALENDAR.

APRIL.

BARLEY.

THE barley crops not ſown in March, muſt be in the ground by the middle of this month without fail, or a poor crop may be expected. The land I ſuppoſe to lay as thrown up in the autumn before; ſo that whenever ſown, it is on the ſpring earth. This ſuppoſition is abſolutely neceſſary; becauſe, if there had been previous plowings in March, or the end of February, the ſeed ſhould then have been ſown; excepting, however, turnip land, which broke up at firſt too rough to ſow, which will ſometimes happen. The farmers, in ſome parts of the kingdom, will put off their ſowing till the laſt week in this month, and the firſt or ſecond of May, for the ſake of gaining time for giving three ſpring earths; but they loſe more by far from late ſowing, than they gain by making their land fine. If clover is, as it always ought to be, a principal object, and they had not the land fine enough before, delays muſt be made; but ſtill they can ſcarcely be owing to any thing but bad huſbandry: for a farmer ſhould always have ſuch events in view, and give the tillage before winter, on lands not cropped with plants that ſtand till the ſpring. The utmoſt exertion of good huſbandry ſhould be made to reconcile jarring circumſtances when they cannot be totally prevented. Theſe obſervations on barley are equally applicable to white oats.

White Peas.

This is the proper ſeaſon for ſowing the white boiling pea. The land ſhould be light, either ſandy, gravelly, or a light loam

loam, in good tilth, and the ſeed harrowed in, abont three buſhels to an acre. It is a very profitable crop on ſuch ſoils, killing the weeds intirely, if the peaſe are luxuriant, and much ameliorating the land; but on clays and heavy wet loams, the culture is by no means adviſeable, unleſs they are well drained, in good heart, and excellently pulveriſed.

Buck wheat.

The lands deſigned for buck-wheat, in May, ſhould be well tilled this month, plowed twice, and harrowed three or four times. It is not neceſſary for that grain, but for the graſſes you ſhould always ſow with it, and for that moſt important object of making all the ſeed weeds grow, in order to turn them down by the following plowing. This April preparation marks the land for buck-wheat: I ſhall therefore, take this opportunity to adviſe the farmers in general to try this crop more. Nineteen pariſhes out of twenty through the kingdom know it only by name. It has numerous excellencies, perhaps as many to good farmers, as any other grain or pulſe in uſe. It is of an enriching nature, having the quality of preparing for wheat, or any other crop: this is a certain fact, and cannot be diſputed, one buſhel ſows an acre of land well, which is but a fourth of the expence of ſeed barley. You ſhould not ſow it, till about the middle of May: this is very important; for it gives you that valuable time in the ſpring, enough to kill all the ſeed weeds in the ground, and brings you under no diſagreeable neceſſity, from bad weather in March and April, to ſow ſo late, as to hazard the crop; frequently the caſe with barley and oats. It is as valuable as barley; where known, ſells at the ſame price, and, for fatting hogs and poultry, much exceeds it. It is, further, the beſt of all crops for ſowing graſs-ſeeds with; giving them the ſame ſhelter as barley or oats, but not robbing them at all.

Sainfoin.

Lucerne.

This plant is one of the moſt famous that is cultivated in England: it has, particularly of late years, been more the object of converſation than moſt others, and opinions about it have varied as much. I ſhall not enter into a deduction of a general nature; but only point out the beſt methods of treating it, in each of the three grand diviſions, which modern writers have thrown the culture into, viz. broad-caſt, drilled, and tranſplanted.

If you ſow broad-caſt, it ſhould be with buck-wheat, upon land very rich and good, but not wet, and as clean from weeds as the moſt perfect culture can have made it. The proper quantity of ſeed is twenty pounds to an acre. It ſhould be ſown on the flat, and covered by three harrowings. There cannot be a doubt, but lucerne will anſwer to great profit in this way, if the land is extremely rich, and of a deep ſtaple; but on lands, poor gravels, lime-ſtones, or chalk ſoils, I queſtion whether any great ſucceſs will attend it.

For drilling this month, which is the prime ſeaſon, the land I ſuppoſe to have been thrown on to the ridge in October, and well water-furrowed, and to have been plowed and harrowed well in March, and the firſt week of this month. The laſt of theſe plowings ſhould have thrown it on to five-feet ridges, after which they ſhould be harrowed with drill harrows. About the middle, or latter end of the month, thoſe ridges ſhould be manured, at the rate of twenty loads an acre of ſome very rich compoſt, that is fine, and will not impede either the harrows or the drill. This ſhould be turned in by another plowing, and, at the ſame time, arched up; then harrowed again, and drilled with three rows, one foot aſunder. About five pounds of ſeed will be ſufficient. There is no drill culture of lucerne that exceeds this. The tranſplantation will be treated of under another month.

Drilled lucerne is an extreme valuable crop on rich or well-

manured lands, and with good management. A ſpirited farmer ſhould therefore determine to cultivate a good quantity of it, that he may at leaſt have a ſufficiency for all thoſe purpoſes, to which it is particularly adapted: theſe are, feeding horſes with it green in the ſtable, mown every day; keeping milk cows and young cattle, and work oxen; alſo for feeding ſwine; but, for feeding horſes, its uſe is ſo very great, that no farmer ſhould be without a proper quantity for keeping all his teams on. One thorough good acre of lucerne will keep four or five horſes, from the firſt of May to the end of October: a degree of profit, which no other graſs will equal. I cannot therefore avoid particularly recommending to all huſbandmen drilling a few acres of ſo excellent a graſs, that will be ſure to pay him ſo amply for his trouble; nor ſhould he neglect good manuring, or conſtant and dilligent attention to keeping his crop perfectly clean from weeds.

Sainfoine.

There are ſeveral parts of this kingdom, in which the farmers could not poſſibly pay half their preſent rents without the uſe of this graſs. On dry limeſtone and chalky ſoils, or on any very dry ſound land, no matter how poor, it will thrive to extraordinary profit. April is the proper month to ſow it in: the land ſhould be perfectly clean, and free from weeds and the ſeeds of weeds; and this is the only circumſtance required. It matters not how poor it is: ſow it with barley or buck-wheat; the land in as fine tilth as poſſible, and the ſeed covered only by one harrowing, if the harrows are heavy, or by two if they are light, and let it be when the land is perfectly dry. Upon the ſoils proper for this graſs, no man can ſow too much of it: for no other uſe of the land will pay near ſo well. It will on very poor ſoils, not worth more than from one ſhilling to two ſhillings and ſixpence per acre, yield a ton and half of hay, or a ton at the leaſt, at one mowing per acre, and afford a conſiderable after-graſs beſides. Now, the un-

hay is ſo univerſal, that ſuch products can never want a market; nor ſuch land, thus improved, fail of becoming a vaſt ource of profit to whoever has ſpirit enough to purſue ſuch beneficial conduct. The products and profit of ſuch land in illage, or in a ſheep walk, are quite contemptible to them when own with ſainfoine. The proper quantityof ſeed is from four ve buſhels per acre: it flouriſhes ſo well broad caſt, that to no inducement to attempt it in the drill method.

Sheep.

This is the month that tries the farmer more than any ther in the year. In the whole range of huſbandry, there no point that puzzels the farmer more, than providing for heir flocks through April, and the firſt week of May. It roves the good huſbandman as much as any other article in he moſt extended farm. The common management is to epend on turnips and hay; and, when the former are done, o turn them into a piece of rye ſown on purpoſe, or into the rops of wheat, to feed them off; and theſe reſources not be- g proportioned to the want, they let them run over moſt f the clover and paſtures of a farm; by which means the rops of hay, and food for large cattle, are greatly damaged. Bad as ſuch a ſyſtem of management undoubtedly is, yet it ctually forms the huſbandry of three fourths of the kingdom, nd the bad conſequences are felt ſo ſtrongly, that the number f ſheep on all ſuch farms, is governed by the food in April. None of them are ſtocked properly with ſheep throughout he whole year, for want of more food at this ſeaſon: but here are other farmers, who have felt ſuch inconveniencies o ſtrongly, that they have taken a few ſteps to remedy them: hey keep their turnips as long as poſſible, ſo as to make their hoots an object of ſheep feed; and they every year ſow a iece of clover and ray-graſs on land in pretty good heart, to e ready in the ſpring to take their flocks from turnips, and eep them till the general turning to graſſes arrives, which

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is about the tenth or twelfth of May. This conduct, I must obſerve, is an improvement on the other; for it gets rid of three great evils: depending on rye, which is a moſt paltry feed, and never pays expences; ſeeding the wheat, which is pernicious to the crop; and turning too ſoon into the general paſtures. But at the ſame time that it effects this advantage, it is open to ſome objections, which require a further improvement. The keeping the turnips long in the ſpring is very bad huſbandry: it damages greatly the barley crop, both inrobbing the land, and in preventing its being ſown in proper time; nor is the food of great conſequence; for you muſt have many acres of turnip tops to keep any ſtock of ſheep: and as to the roots they grow ſo ſticky and hard after the tops are at all advanced, that their value is much declined: then in reſpect to ray graſs, the clover mixed with it, at this ſeaſon, is ſeldom above three inches high; and a vaſt breadth of ground, to a given ſtock, muſt be aſſigned to keep the ſheep from the middle of April till the twelfth of May.

It is ſurpriſing the number of acres of that young growth neceſſary to keep an hundred ſheep and lambs: ſo that theſe farmers, although they manage to ſpring feed more ſheep than the worſt of their brethren, yet effect it at a greater expence and at laſt not in any degree comparable to what they might do.

A turnip ſhould never be ſeen on the ground after March for the month of April the farmer ſhould have a field of cabbages ready, which, yielding a vaſt produce on a ſmall breadth of ground, reduces the evil greatly of a late ſpring ſowing; and if he manages as he ought, totally excludes it, by planting cabbages every year on the ſame lands. The large Scotch cabbage will abide the ſevereſt froſts, and will not burſt it will laſt through April. The turnip cabbage will laſt to the middle of May; and, though it runs for ſeed, yet the bud will not be hard or ſticky. The green boor-cole may be ſo

off ſeveral times; it is impenetrable to froſt, and will make long ſhoots in the very depth of winter. If I was to recommend a cabbage culture, I ſhould prefer the Scotch for April, on account of its vaſtly ſuperior produce; and the two latter ſorts for the firſt fortnight in May. A few acres of land would, in this method, ſupport a very great ſtock of ſheep; as may be judged from an aſſertion of a very experienced cultivator of cabbages, that one acre of the great Scotch will winter fifty ſheep.

Another crop for feeding ſheep in ſpring, which is of particular merit, is burnet: an acre of it, managed properly, will at this ſeaſon yield three times the food of an acre of clover and ray-graſs. It ſhould be five or ſix inches high in November; and left ſo through the winter. Burnet has the ſingular quality of maintaining its green leaves, to their full growth, quite through the ſevereſt winter: ſo that, under deep ſnows, you find an amazing luxuriance of vegetation. From November to February, the crop will gain two or three inches in growth, and then be ready for ſheep. It will be better in March, and if kept, ready in April, not only for ſheep, but for horſes, cows, or any other ſtock. This is a product, which no clover, or ray-graſs in the world will equal; and it is the peculiar uſe of burnet, to which it ſhould ever be applied.

Cows.

It is no object to a good farmer to get his cows out of the farm-yard this month, eſpecially if he has a proviſion of cabbages and ſtraw as he ought: he muſt be very amply provided with graſſes, indeed, to do it to a good purpoſe, as his flock of ſheep muſt be the firſt object for his ſpring ſeed. Beſides, the raiſing great quantities of manure, in the farm-yard, is ſo important an object, that he ſhould keep it in ſight as long as poſſible: turning out any cattle before there is a thorough good bite for them, is but trifling, and it is very unprofitable; for a field, ſo begun, will not laſt proportionably with

with another of a proper growth. The milk cows ſhould have their bellies full of cabbages throughout this month, with ſtraw before them, and always kept both in the yard and houſe well littered. The lean ſtock of dry cows ſhould likewiſe now have an allowance of cabbages.

Horſes.

Keep your horſes cloſs to the ſtable throughout this month: do not think of turning them out yet, and have plenty of litter, that they may continue to raiſe much dung. This is ſo buſy a time, that you ſhould have a cloſs eye to the work your teams perform: remember one day now is worth two bye and bye; follow the directions laid down laſt month, in making them do ten hours work every day.

Oxen.

The ox teams, at this ſeaſon being kept to pretty ſharp work, ſhould be well fed. Give them good hay, and a daily allowance of cabbages. If they are large beaſts, they ſhould have fifty pounds of cabbages each, every day. This is a riſe, among many others, that will be found to ſhew the great conſequence of having plenty of cabbages.

Hogs.

The ſtock of fatting ſwine ſhould now be all gone, but the ſows, pigs, and lean hogs, require good attendance: there is nothing yet for them in the fields: they muſt be kept therefore cloſe to the farm-yards, where the thraſhers (who ſhould be kept at work quite through this month) will partly ſupply them with food; and your waſh ciſterns, and winter ſtores of rots, parſnips, potatoes, &c. will keep all in good heart.

Potatoes.

The latter end of this month, the land planted with potatoes ſhould

hould all be hand-hoed over the whole ſurface, to cut up weeds clean, and looſen the earth. This management is known only in the neighbourhood of London; but it ſhould be extended over the whole kingdom, for the excellency of it is indiſputable. The expence of hoeing, where there is a clear ſpace to cut, is trifling to that of a crop, and, conſequently, the ſucceeding cleaning which the potatoes receive after they are up, is performed at a much leſs expence, on account of this operation, and, at the ſame time, in a more effectual manner.

Carrots.

If the carrot ſeed was ſown very early, the crop will be ready for the firſt hand-hoeing. the latter end of this month The rule is, to give it as ſoon as the young carrots can be diſtinguiſhed from the ſurrounding weeds; and it ſhould never be done in wet weather. The men muſt uſe three inch-hoes, with handles about two feet long; and they muſt move on one knee, in they way gardners hoe onions, &c. If the crop is pretty full of weeds, they muſt not attempt it ſtanding with common hoes; for it is very nice work to diſtinguiſh the young carrots. This hoeing, if the crop is full of weeds, cannot be done under thirty ſhillings an acre, where the daily pay is one ſhilling and two pence a day.

Cabbages.

April is the grand ſeaſon for planting the crop of autumn-ſown cabbages: it is a work extremely eaſy to perform, and not at all expenſive; but it is neceſſary to manage it in a judicious manner, ſo that it may be done to the beſt advantage. Juſt before planting, the land is to be plowed from the ridges of the laſt earth, arching them up: this earth ſhould turn in the manure; then the ridges are to be harrowed, and one row of plants ſet along each: this is for four, or five feet ridges; but, if you plant on three feet ones, inſtead of arching up, you only

only reverſe, and plant one row along the top, in the ſame manner as on the others.

Women or boys ſhould lead the way with the plants, and drop them, as nearly as they can, where they are to be planted: then the men follow with dibbles, and ſet them: the work goes off quickly, and is not expenſive. Upon an average, it may be done in ſingle rows, four feet aſunder, from four ſhillings to five ſhillings an acre. Keep the men at it as long as they can ſee; for, if the weather is very dry, it will be an advantage to the plants, to have dews and coolneſs of the night ſucceeding the planting.

Water-furrowing.

This is a work that ſhould be well performed on the new ſown lands, as ſoon as the tillage is finiſhed. Very ſmall ſavings in the omiſſion of this work, will be attended with certain and great loſſes.

Turnip Fallow.

The fields intended for turnips ſhould receive one plowing in this month, which ſhould remain a little while, and then have harrowings enough to make all the ſeeds of weeds grow that the tillage, in the ſucceeding month, may deſtroy them: theſe plowings ſhould be on the flat.

Hedging.

This month muſt conclude the buſineſs of fences. It is bad huſbandry to cut any hedges after April, nor do you give the plaſhes a good chance afterwards: they will not be ſo ſure of growing. Obſerve alſo, now to bring home all the fagg wood, ariſing from the hedges: it ſhould be left no longer

Clear Graſs-fields.

The beginning of this month you ſhould attend particu

ly to the clearing your graſs-lands from all rubbiſh that may affect the young graſs; ſuch as the cores of ant hills, the ſticks and buſhes that are left after hedging, and whatever elſe may happen to be found that will obſtruct the ſcythe. Mole caſts ſhould be ſpread about with a ſpade; and, being nothing but fine looſe moulds, will do good to the graſs: the keeping the meadows and paſtures in a neat huſband-like manner, requires a good attention of this ſort.

Rolling.

After the graſs is cleared, in the manner mentioned in the laſt article, it ſhould be rolled to level it for the ſcythe: the roller muſt be juſt of weight enough to level worm-caſts, and cruſh ſmall molds; that is, a ſize larger than a common barley roller. Some gentlemen are extremely fond of uſing very large and heavy rollers, thinking they are beneficial in proportion to their weight; but this idea has been much diſputed of late. Another practice, founded on direct contrary principles, has begun to take place, that of ſcarifying graſs with a plough, conſiſting only of coulters or harrow teeth. The advocates for this practice aſſert, that the burthen of hay (not the beauty of graſs) as a lawn is much encreaſed by looſening the ſurface, for the roots to have the power of a freſh vegetation: that the fault of moſt paſtures is the being quite bound and hard; rolling increaſes this tenacity, and is conſequently pernicious. Experiments are mentioned which prove, that graſs-lands are infinitly improved by this operation of ſcarifying; and, further, that its uſe is extremely great to precede manuring graſs lands; for that much difficulty is found to get the manure below the ſurface for the roots to feed on: whereas, if it be ſcarified well, the ground is opened ſo much, that whatever you ſpread on it gets at once to the roots; conſequently a ſmall quantity, ſo applied, goes as far as a much larger, laid on in the old way. It muſt be confeſſed, that all

the reaſoning appears very juſt, and perfectly conſonant with the ideas we have of good huſbandry in moſt other parts of the management of ſoils. It however is highly worthy of a fair trial, that the truth on every ſoil may be known; for it is a vaſt expence that ſome perſons put themſelves to in rollers, amounting ſo high as fifty pounds a piece.

ARTICLE XXXI.

Of the culture of Plants, whereof the ſtalks and leaves are the principal parts

[DICKSON'S AGRICULTURE, Vol. II.]

IT is wiſely ordered in nature, that the plants which grow without any culture, are proper for maintaining the cattle moſt uſeful to us. Hence it became an univerſal practice, to allow a certain proportion of land in every farm to reſt for food in the ſummer ſeaſon to the cattle that laboured it, and this was changed from one place of the farm to another, as the ſituation of the land required, or was moſt for the conveniency of the farmer.

This, not many years ago, was the ſtate of all the cou countries in Scotland. The graſs upon the farms, as may well be ſuppoſed was very bad, for no land was allowed t reſt while it was fit for carrying a crop of corn. Even ſup poſing that ſome ſmall fields were laid off in tolerable orde yet it required a greater number of years to bring a goo ſward upon theſe, than the farmer found it convenient to al low.

Matters continued to be carried on in this manner, t the demand for butcher-meat began to encreaſe. This in troduced incloſing; for excepting a deer park, or a few ſma cloſur

inclosures about a great man's houſe, there are very few in Scotland, that have not been made in the memory of ſome perſons ſtill living. Then likewiſe, the farmer obſerved, that it would be a great benefit to him, to raiſe good graſs without waiting the time neceſſary to produce this, in the ordinary way of allowing land to reſt.

The demand for butcher-meat encreaſed, and from this and other circumſtances, encreaſed likewiſe the demand for hay. To ſupply theſe demands, the ſowing of graſs-ſeeds became neceſſary. The kinds introduced into Scotland, are theſe following; rye-graſs, clover, lucern, and St. foin. The culture of theſe ſhall be ſeparately treated of.

Of Ryegraſs, or Ray-graſs.

Rye-graſs is the moſt common of all the artificial graſſes cultivated in Scotland, and notwithſtanding what ſome have ſaid againſt it, is not the leaſt valuable. Like the common graſs that grows naturally in our fields, it is a fibrous rooted plant, and binds the ſoil on which it grows. This has ſtirred up againſt it many enemies who aſſert, that it is a very great impoveriſher of land. This graſs has got this bad character, perhaps more from the practice of the farmer, than the nature of the graſs; and were any of the other graſſes treated in the manner that this kind is often treated, they would perhaps be found as great, if not greater impoveriſhers of land than it is. Rye-graſs is often allowed to perfect its ſeed; when clover is allowed to do this, it is found very hurtful, probably more ſo than the rye-graſs.

But though rye-graſs, in ſome reſpects, may be inferior to ſome of the other graſſes cultivated in our fields, yet in juſtice it muſt be obſerved, that it has ſome advantages that are peculiar to itſelf, and theſe advantages too very conſiderable; it grows upon ſoils, on which none of the other artificial graſſes ſucceed; and it is uſeful to deſtroy weeds, particularly

larly the quickening graſs, by which our lands in Scotland are ſo much infeſted.

Soils that are ſhallow or ſpungy, or have a great mixture of moſs, cannot be prepared by any kind of culture ſo as to carry good crops of clover, but theſe ſoils may be prepared in ſuch a manner, as to make rye-graſs thrive very well.

When rye-graſs is ſown, it ſoon covers the ſurface with a ſward. This prevents all the roots from vegetating, whoſe ſtems are not ſtrong enough to pierce through it, among which are the roots of the quickening graſs; and thus being prevented from vegetating, they ſoon rot in the ground.

This kind of graſs is often ſown, mixed with other graſs ſeeds; and this is, no doubt, a very proper way when the ſoil allows; but ſoils, as has already been obſerved, that are ſhallow, wet, ſpungy, or have a mixture of moſs, are unfit for clover of every kind; and therefore on theſe it becomes neceſſary to ſow the ray-graſs without any mixture.

The ordinary way of ſowing ray-graſs-ſeed, is along with a crop of oats or barley. When ſown along with barley, it is neceſſary to roll the field, that ſo the ſap may be the better preſerved at the dry ſeaſon of the barley-ſeed; if it is not rolled, it is neceſſary to harrow it well; for the better that land is harrowed, it becomes the firmer. When land is left open, the drought, which is very common at the ſeaſon of the barley ſeed, eaſily penetrates it, and thereby prevents any ſeeds, which ly near the ſurface, from vegetating. This precaution is not ſo neceſſary when the rye-graſs ſeed is ſown along with oats. The land on which oats are ſown, is, generally ſpeaking, from its culture, firmer than the barley land. Beſides, the ſeaſon of ſowing the oats, is earlier than the ſeaſon of ſowing the barley; and therefore the land, at the time of ſowing, is always ſufficiently moiſt, ſo that the graſs-ſeeds are able to ſtrike root before the drought ſets in.

This kind of graſs ſeldom hurts the crop of corn. When

he ſoil is open and looſe, it is of advantage: it firms the oil, and thereby prevents the corn from lodging.

Though the common way is to ſow the rye-graſs ſeed with orn, yet when the land is poor, it is a better way to ſow by itſelf; and ſtill a better way to ſummer-fallow, and ſow he ſeed in the autumn. In this caſe, if the land is well lowed, though not very rich, it will produce a tolerable rop. But as the land by the fallowing is made open and oſe, and as the plowing and ſowing are near to the rainy aſon, it becomes neceſſary to prevent all cattle from paſtu- ing upon it, or even touching it during the winter, except n the time of hard froſt: For the cattle in paſturing, if the nd is not firm, are not only in danger of pulling up the oung plants, but alſo of doing great damage with their eet.

Though the land ſown in the ſpring with this ſeeed, has nger time to ſettle before winter, than what is ſown in the utumn, yet the farmer ſhould be careful not to allow much aſturing upon it, eſpecially in wet weather, except the au- umn has been remarkably dry. The corn growing along ith the rye-graſs keeps out the drought, and in ſome mea- re too keeps the ſoil open, by the ſhaking of the ſtalks. When the ſeed is ſown by itſelf in the ſpring, cattle may be llowed, with greater ſafety, to paſture upon it in the winter; r the ſummer drought penetrates deeper, than when corn rows along with the graſs; the roots of the rye-graſs, ha- ing nothing to interrupt their progreſs, ſpread more along e ſurface, and the blade giving very little reſiſtance to the ind, the ſoil is leſs ſhaken. But though the ſowing rye- raſs by itſelf in the ſpring has this advantage, yet there is n inconveniency in this, that muſt be attended to. Weeds aturally riſe along with the rye-graſs ſown in this manner; nd, if allowed to ſtand, they come to perfection, ſow their eed, prevent the graſs from covering the ſurface, and keep e ſoil open by their motion. This makes it neceſſary to

chooſe

chooſe very clean land for the rye-graſs, when it is to be ſown in this manner, or to cut down the weeds when they come up, which indeed may be done at a very ſmall expence.

Rye-graſs ſeed is ſometimes ſown for hay, and ſometimes for paſture-graſs. When for hay, there are commonly ſown upon the acre from 2 to 4 firlots, wheat-meaſure; when the land is much infeſted with weeds, the more ſeed is required, whether it is deſigned for hay or paſture.

Rye-graſs riſes very early in the ſpring, and, if the ſoil is dry and warm, affords a good paſture all the winter. It is very hardy, ſtands the froſt, and, if continued in paſture, does not wear out in many years. The proper way of uſing it is, to eat it down in the ſpring and beginning of ſummer, and after that to let it reſt till the autumn. When it is allowed to get up in the ſummer, it runs to the ſeed, and becomes diſagreeable to the cattle. But if it is eat down early, this inconvenience is prevented, and by this management too a good crop may be expected in the autumn. This way of manageing rye-graſs may be the more freely recommended as it can be done by the farmer without any difficulty.

The rye graſs makes very good hay, when properly managed. There is ſuch a demand for the ſeed of this graſs that the farmer is often tempted to let it ſtand till the ſeed is perfected, and then to thraſh it. When this is done, it cannot be expected that the hay can be good. The ſap aſcends from the ſtalk to the ſeed: Before the ſeed is formed the ſtalk is full of ſap: As the ſeed ripens, the ſtalk loſes its ſap; and when the ſeed is perfected, the ſtalk becomes withered and dry, and contains very little nouriſhment. If regard therefore is to be paid to the goodneſs of the hay, in the culture of this graſs, it ſhould be cut before the ſeed is ripe. When the ſtem has attained its full height, and the ſeed completly formed, 'tis probable that the plant then contains the greater plenty of juice, and that, if cut in this ſituation, the hay is beſt and the crop greateſt. All the ancient writers

e of this opinion. Cato directs that the hay be cut before e feed is ripe. Varro, that it be cut when it ceaſes to ow, and begins to dry. And Columella, after giving the me direction, adds as the reaſon, that when the graſs is t in this ſituation, the crop is greater and the hay more reeable to the cattle.

As rye-graſs, when cut as ſoon the ſeed is formed, af-rds the beſt crop of hay, ſo this management makes the op leſs ſevere upon the land than when it is allowed to and longer. It is certain that plants, when they are allow-d to bring their ſeed to perfection, exhauſt the ſoil much ore of its vegetable food, than when they are cut or pulled up fore this. A crop of turnip is an eaſy crop, when the tur-ips are pulled up for the ſake of their roors; but, if allowed ſtand for ſeed, there is not a crop more ſevere. When e farmer then propoſes to cut his rye-graſs for hay, and to ke crops of hay for ſome years ſucceſſively, it is neceſſary at he cut it before the ſeed is ripe. By this management, is land carries better crops while in graſs, and is in better rder when broke up again for corn. If the graſs, by being t a little earlier than ordinary, ſhould not produce ſo large crop of hay, as it would have done, had it ſtood ſome time nger, it is probable that this loſs is made up in the good-eſs of the fog. For the earlier in the ſeaſon that the graſs cut, the fog is always the better, and good fog is often proportion more valuable than a good crop of hay.

When the hay crop is the principal thing intended, the g ſhould not be touched, but allowed to rot in the winter. he cold drives back the ſap from the leaves into the root; y this the plants are ſtrengthened, and able to produce a reater crop in the ſummer. By this management ſome per-ons have had good crops of hay for 14 or 15 years ſucceſ-ively, without any dung, and it is probable that, by the ſame anagement, good crops of hay may be got for any num-er of years.

ARTICLE XXXII.

The advantages of Shallow Plowing; by Mr GEORGE CLARK.

From Eſſays and Obſervations, Phyſical and Leterary.

IT is ſome years ſince I firſt learned from gentlemen of obſervation, that the farmers in Norfolk, and the neighbouring counties, plowed very ſhallow, and, notwithſtanding, raiſed good crops, and were eſteemed good huſbandmen.

Some are convinced from what they hear or read; nothing will make impreſſion upon others but ocular demonſtration; and, for my part, I am of the laſt claſs, an unbeliever, that could not ſee the weight of the arguments advanced in ſupport of the practice, till I had an opportunity of travelling through that part of the kingdom, and obſerving the management of the gentlemen and farmers, which of late has raiſed the county of Norfolk in particular, from a ſtate of poverty to that of plenty and great affluence.

That the import of the following obſervations may have the deſired effect, it will be neceſſary to give a ſhort account of the natures of the ſoils where the practice is followed.

It was in Lincolnſhire where it firſt drew my attention and induced me to meaſure how deep they went with the plough; which I found, after many accurate trials, ſeldom exceeded two and a half, and never, that I remember, three inches.

The high lands of this country conſiſt commonly of a light ſandy ſoil, that ſeems to be formed by the air and rains breaking and crumbling down a baſtard lime-ſtone, that lies in moſt places only a few inches under the graſs, dipping and riſing according to the depreſſions or elevations of the county

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it in general hanging to the eaſt. Little or no water re-
ains here on the ſurface; for the ſtone being open,
ſinks as it falls from the heavens, and never appears again
ll it comes to the level of the marſhes, or fen-country, where
e ſoil may be ſaid to have no bottom, at leaſt it is deeper
an can be reached by any method of culture.

The high grounds are for the moſt part common, or em-
oyed in paſture for ſheep. The low or fen countries have
ow and then alſo very extenſive commons; but the reſt of
e country is well divided and incloſed, the ſoil rich, and
roducing, when in tillage, weighty crops of hemp, flax,
rnip, barley, graſs ſeeds, wheat, oats, and, when laid down,
e beſt paſture for cattle of all kinds.

What may properly be called the high grounds of Norfolk,
e generally covered with a very thin light ſoil; the low
nds are of the ſame quality, but the ſoil deep, occaſioned
waſhing or blowing from the higher parts.

The brooks and rivers run in extenſive marſhes, made by
e ſprings breaking out on their ſides; for, as the whole
untry ſeems to lie upon one lump or maſs of grey chalk,
hich they call marle, the ſuperficial water ſinks quickly, and,
was obſerved before in Lincolnſhire, does not appear again
l it reaches the level of the marſhes; and it may be taken
almoſt an univerſal rule, that, under any extent of
untry where the water ſinks in this way, the greateſt part
the *ſtrata* will be found calcarious or lime-ſtone.

Derbyſhire produces many inſtances of this.

The number of chalk or marle pits, every where opened
in Norfolk, give great opportunities of ſeeing the nature
the *ſtrata* that lie neareſt the ſurface.

The ſtaple is generally of the light ſoil above mentioned,
en a brown oker coloured ſand, mixed with pieces of flint,
ry dead in its nature, and ſeems to contain not the leaſt
inciple of vegetation, but is, in my opinion, a certain ſign
at the chalk is at no great diſtance; and it is common to

obſerve deep holes in the chalk, which is otherways very ſo-
lid, filled with this ſand. They have alſo clay-lands; and,
when any conſiderable quantity of chalk is mixed with it,
they give it the name of clay-marle, and eſteem it the beſt
for the improvement of light land.

What they call *cragg*, is no other than banks of ſea ſhells,
though they are now and then found at a conſiderable
diſtance from the preſent ſhore; it is a very valuable manure,
and highly eſteemed.

It would ſpend too much of the Society's time to mention
the nature of the ſoils in the neighbouring counties, where
the ſame practice is followed, and where they have alſo very
ſtiff clays, all plowed in the ſame way, never going above
three inches deep, and ſeldom above two and a half, whatever
be the ſoil or intended crop.

The reaſons that the farmers and gentlemen give, are,

That land turned up with a ſhallow furrow will produce
an equal or better crop than when plowed deep, even tho'
the ſoil ſhould allow them to go down any length; for that
by plowing deep, they would turn down, and hide from
the influence of the weather, the ſurface and beſt part of the
ſoil, inriched with the roots of of plants, &c.

That by repeated experiments, they found, that ten cart
load of dung or marle will go as far in improving an acre of
land, when only plowed three inches, as twenty would do of
the ſame manure, if they plowed ſix inches; and ſo in pro-
portion; and that, by the ſame rule, manure may be carried
to advantage double or triple the diſtance.

That as the work is lighter, fewer cattle and ſervants are
neceſſary to carry on their huſbandry.

That land plowed ſhallow is much eaſier cleaned of weeds,
as their roots are with leſs trouble expoſed to the ſun and
wind, and the ſeeds of annuals brought nearer the ſurface,
and by that means encouraged to vegetate, which is neceſſary
before they can be rooted out and deſtroyed.

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Should their marle or manure go down, it is eaſier brought up than when ſunk in a deeper furrow, where the air and weather can have little or no influence.

If ground is ſtoney, it will be cleared with leſs or more trouble in proportion to the deepneſs the plough runs.

That ſhallow plowing will bring always the earlieſt crops, which are found, at leaſt in all cold countries, to be the beſt.

That the farmers in Norfolk are in a better channel of improvement than their forefathers, none will doubt who knows how much the rents and wealth of that country are increaſed. But ſome may alledge, that, if they plowed deeper, the improvement would be greater. I doubt greatly of this, when I compare the ſoil and rent paid by them, with the ſoil and rent paid in other parts of England; for in Norfolk there are large tracks of land, for which the farmer pays to the landlord twenty ſhillings per ſtatute acre; and when this is the caſe by agreement and common cuſtom, the tithe is five ſhillings, and the poor rates three ſhillings, or three ſhillings and ſix-pence, all paid by the tenant. The ſtatute-acre being as four to five of ours, a fourth part of the above ſums muſt be added to the account; which will then ſtand thus, when reduced to our meaſure,

To the maſter	L.	1	0	0
To the church		0	5	0
To poor rates		0	3	6
To allowance for the difference of the ſtatute Engliſh acre for ours		0	7	0
Total	L.	1	15	6

It is true, that ſeveral of the old leaſes, granted when they firſt began to improve, ſtill continue in force, and that by theſe the farmers are only obliged to pay from ſeven to eight ſhillings per acre, and the tithes and poor rates in proportion: But it is as certain, when any of theſe leaſes fall, the grounds are

are never let under double the old rent, and moſt frequently at the rate above mentioned.

Their wheat and oats are good, their barley is eſteemed the beſt, and their crops of turnips are heavier than in any other part of England. Some roots arriving, by the common culture of the county, namely the hand hoe, at a ſize greatly ſurpaſſing any thing we yet know of, though raiſed in the horſe-hoeing way.

I humbly apprehend, arguments from what we obſerve of land lying in a natural ſtate, may be even brought to ſupport the practice: But this paper being drawn out already to too great a length, I ſhall only here remark,

That where lime ſtone or chalk comes near the ſurface, there the effects of it are ſeen upon all roots, plants, and trees, but when it lies only a few inches under the ſurface, perhaps not above eight or nine inches under the graſs, and in a horizontal poſition, from which there is no waſhing, then it appears not to do the leaſt good to what is above it, but lies dead till expoſed by ſome accident to the more immediate influence of the weather.

The flat moors in Yorkſhire produce many ſtriking examples of this; for, where on a level, they are covered with nothing but heath; but on the ſides of declivities, where the lime ſtone beds break out to the day, there the ſwaird is green, and covered with the beſt kinds of graſs, the water that runs over and waſhes the lime ſtone, impregnating all below, till it meets with an opportunity of ſinking; then the heath again takes place, till a new bed breaks out; and it is moſt remarkable, that all kinds of cattle will feed fat in two thirds of the time upon what is called a lime ſtone bottom, that they will do upon any other unlimed land; the ſame effect may be produced by bringing a ſufficient coat of lime upon the ſurface of the heath or graſs.

When we enrich old graſs by dunging, the dung does not go down any conſiderable length, but will be found, for many

years

years after, remaining on the ſurface, at leaſt, the earthy part of it.

That if trees are planted too deep at firſt, they make no progreſs till the roots riſe, and run alongſt the ſurface. Even old trees do not puſh their roots downwards; and though the weight of the trees depreſs that part of them which join the trunks, yet theſe, when at ſuch a diſtance as not to be influenced by the incumbent weight of the tree, riſe to the top.

Some experiments are now trying, to determine, whether the ſame practice of ſhallow plowing will anſwer here as it does in Norfolk, and other places of the world. For tho' I have had no opportunities of ſeeing their method, yet there is reaſon to believe it anſwers in many of the ſouthern climates, where, from the accounts given of the nature and number of cattle they employ in working a plough, it is impoſſible to ſuppoſe they go deep; and if it is found to anſwer in theſe countries, where the heats are frequently too great, ought it not to be attended with great ſucceſs here, where the ſun has much leſs influence, and where our crops are frequently loſt for want of warmth to bring them to maturity?

ARTICLE XXXIII.

Obſervations upon the foregoing Paper concerning Shallow Plowing; by LORD KAMES.

From Eſſays and Obſervations, Phyſical and Leterary.

HOWEVER much ſhallow plowing may have prevailed in particular ſpots, or even in a whole county, one will be apt to ſuſpect that it is owing to neceſſity or indolence, eſpecially as the oppoſite practice is every where adopted in theory. At the ſame time, every man of ſcience muſt

muſt be acquainted with many favourite topicks, that, after a long eſtabliſhment, have been overturned by the moſt ſatisfactory experiments. And among the numerous maxims in art, as well as in ſcience, that at preſent paſs current, it is probable that they would not all of them ſtand the teſt of accurate and bold enquiries. For that reaſon, I gladly pay my tribute of praiſe to the author of this paper, for his freedom of inquiry; though I am not convinced, either by his authorities or reaſonings, that, in general, ſhallow plowing, is beſt: that is, where the plough is kept within three inches of the ſurface.

A practice eſtabliſhed upon ſenſible principles, ought to be much regarded; not where it is derived from ignorance, chance, or prejudice. Huſbandry is yet in its infancy, and the bulk of its practice hitherto is, I am afraid, derived from one or other of the ſources now mentioned. Practice, therefore, ought not to have great weight in huſbandry: and, were it to have weight, it would lieagainſt ſhallow plowing; for in Britain, at leaſt, I preſume, that deeper plowing prevails. And if we were blindly to follow authority without reaſoning, we ſhould certainly embrace deep plowing, which, as it is attended with additional expence and trouble, could not readily have become general, but from the experience of great profit.

At the ſame time, there are particular circumſtances in which ſhallow plowing is beſt; and if theſe circumſtances occur in the examples given, the practice is ſo far good, without having the leaſt weight in the general point. The firſt example of ſhallow plowing, is in the fens of Lincolnſhire, where the ground is tender and moiſt. In a ſoil of that kind the roots of plants, to avoid a ſuperfluity of moiſture, cannot be kept too near the ſurface; and to this end ſhallow plowing certainly contributes.

The next example is Norfolk, the ſurface of which is deſcribed to be a thin light ſoil, covering an oker-colour

ſand, dead in its nature, and unfit for vegetation. Shallow plowing here is a matter of neceſſity, and not of choice; for one cannot with too much care avoid ſuch a bottom. The third inſtance, indeed, of plowing ſhallow in ſtiff clay, would deſerve the greateſt regard, were it vouched to be the reſult of rational experiments, after many comparative trials; but, for aught we know, it may be the reſult of imitation only. In the neighbourhood, ſhallow plowing is proper; and the example is perhaps blindly followed, without attending to the difference of circumſtances.

Dropping then authority and practice, from which ſo little ſatisfaction can be obtained, the only reſource left us is, to recur to principles and rational conſiderations; which, at the ſame time, I am afraid, will not carry us far; as ſeveral articles are neceſſary to be eſtabliſhed by experiments before a concluſive argument can be formed. One capital article is, at what depth from the ſurface roots produce their ſtrongeſt effects? Concerning this article, there is nothing aſcertained with any degree of accuracy, further than in general, that ſome roots pierce deeper than others, and that many roots, even of corns, produce vigorous effects much lower than three inches. Were arguments *a priori* to be truſted, independent of experiments, one would believe, that roots are always in the moſt advantageous ſituation where nature places them; and that, accordingly, a plant thrives beſt with downward roots, where nature gives them that direction. If this propoſition hold, to which we may truſt till the contrary be demonſtrated by experiments, it follows, that ſhallow plowing is proper for thoſe plants only which extend their roots horizontally.

But as, beſides lateral or horizontal roots, the bulk of vegetables puſh many roots downward much deeper than three inches, the benefit of deep plowing for theſe plants will appear from the following conſiderations:

In the *firſt* place, it gives room for the roots to extend themſelves

ſelves according to the direction of nature, which, it is preſumed, will contribute to the vigor of the plant. This argument goes upon the ſuppoſition, that the ſoil, as far as pierced by the plough, is proper for vegetation, either naturally, or made ſo by culture; and it muſt be kept in view, that every inch of the ſtaple comes in ſucceſſion to be at the ſurface, and gets the benefit of the ſun and froſt.

Fourthly, In this country, I doubt whether, by ſhallow plowing, winter-grain can be ſufficiently covered to prevent froſt; becauſe I imagine, that a plant receives the greateſt proportion of its nouriſhment from the roots neareſt the ſurface. But at I have little doubt that ſome nouriſhment proceeds from the deepeſt roots, I conjecture, that all other circumſtances being equal, the fertility of the ſoil bears a proportion to the deepneſs of the ſtaple.

Thirdly, I lay great weight upon the following conſiderations: I am greatly inclined to a theory that of late years is creeping into reputation, *viz.* That moiſture is the *pabulum* of plants: That the earth ſerves no other purpoſe but to be a receptacle for moiſture; and that the richeſt ſoil is that which furniſhes a due proportion of moiſture to its plants. Now, let us compare a ſhallow and a deep ſtaple with reſpect to moiſture. Where the ſtaple is ſhallow, the roots, which cannot pierce the hard ground below, muſt ſpread along its ſurface. In that poſition, they are drenched in water upon every ſevere ſhower; and this moiſture lies ſo near the ſurface, that it is immediately ſucked up in time of drought, and vaniſhes by evaporation. Thus it is, that the exceſſes of drought and of moiſture alternately are the conſequences of a ſhallow ſtaple. A deep ſtaple poſſeſſes the oppoſite advantages. The moiſture lodges below the bulk of the roots, and becomes a reſervoir, which ſupplies moiſture to the roots above, even during a pretty long drought.

Secondly By deep plowing, the ſtaple is doubled or tripled. I do nor ſay that this doubles or triples the fertility of the

e piercing froſt. The ſeed ought not to be laid at the bot-
m of the ſtaple; becauſe the hard ground below is very
nproper to receive the tender roots. And if it be laid any
ay near the center of the ſtaple, the earth above will not be
fficient to give it a good covering.

Fifthly, We know by experience, that couch-graſs, thiſtles,
d many other hardy weeds, root themſelves in the ground
uch deeper than three inches. Theſe are not to be eradi-
ted but by deep plowing; and deep plowing, once begun,
uſt be continued; for the under ſtaple left deſerted is ſoon
led with weeds, which will deſtroy what is ſown above
em.

The reaſons given by thoſe who practiſe ſhallow plowing,
eigh not much with me. The *firſt* is, that the ſurface-ſoil,
riched with dung and roots of plants, which is by far the
ſt, will, by deep plowing, be buried, and a ſoil worſe in
uality be brought to the ſurface. This inconvenience, I
ant, will follow, the firſt time the ground is plowed deep;
t then this is but a temporary inconvenience, and will ſoon
niſh, to give place to a ſolid improvement. The rich ſur-
ce-ſoil will not ſuffer by being laid at the bottom. But the
ttom-ſoil brought to the ſurface will ſoon be enriched by
ng, and by the influence of the ſun and froſt. The ſtaple
eing thus enriched throughout, the turning over the ſoil
ll not thereafter have any bad effect; nay, it will have a
od effect, by employing ſoil that has in ſome meaſure been
ng reſted.

The *ſecond* reaſon concerns manure: It being urged, that
load of dung will go as far in improving an acre, hav-
g three inches of ſtaple, as twenty will do where the ſtaple
ix inches. I acknowledge, that it will improve three
ches; but I deny, that the acre will be equally improved
th ten as with twenty load, till it be proved againſt me,
at three inches of ſtaple are as good as ſix, which is the
ry queſtion that is in diſpute.

I admit the *third* and *ſixth* reaſons to be good, as far as they go. A ſhallow ſtaple is frugal, not only in the firſt formation, by ſaving labour in clearing it of ſtones, but alſo by ſaving labour in plowing. But it remains to be determined whether that circumſtance be ſufficient to overballance the advantages of a deep ſtaple.

As to the *fourth* reaſon: I deny that weeds can be beſt cleared by ſhallow plowing. On the contrary, as above hinted, I do not find it practicable to clear the ground of weeds without deep plowing.

As to the *fifth*: Manure that falls to the bottom, is no doubt eaſieſt brought up where the ſtaple is ſhallow. But that very ſuppoſition, if it hold in fact, muſt neceſſarily introduce deep plowing. For manure that hath ſubſided to the bottom of the ſtaple cannot be brought up without going under it, and entering upon the hard ground below; and this operation two or three times renewed muſt produce deep plowing.

The reaſon *laſt* urged is: That ſhallow plowing brings an early crop. One thing I know, that the weakeſt crop is always the earlieſt. If ſhallow plowing bring both an early and plentiful crop, this muſt be acknowledged a great property. But I muſt take the liberty to doubt of the fact, till it be aſcertained by regular experiments. With reſpect to winter-crops, the probability lies the other way. When ſeed is laid deep, ſuppoſing always that it is not buried, it has a warm bed, and is the better protected from froſt. This ought to contribute to an early harveſt as well as to a plentiful one. Another conſideration concurs: Wheat is a tall crop, and apt to wind-wave where the roots are not laid deep in the ground; and this muſt retard its growth. Barley, I acknowledge, is the better for being laid near the ſurface, where dews and the heat of the air may eaſily penetrate. Its growth is alſo

hat ſeaſon of the year which is the leaſt infeſted with winds.

Upon the whole, though I lean to deep plowing, I am far from being rivetted in my opinion. We can truſt little to experience, and the foregoing reaſonings are too ſlight to afford ſolid conviction. Here then is a fair field opened for rational experiments; to promote which, the Society will eſteem it their greateſt honour: And they certainly will be well pleaſed to find experiments upon this head promiſed by one of their own members in the paper which has given occaſion to the preſent obſervations. Experiments cannot fail to ſucceed under the direction of a man whoſe accuracy is not inferior to his knowledge.

ARTICLE XXXIV.

Obſervations upon our Extracts from the FARMER'S KALENDAR—*Obſervations on the uſe of Lime—A miſtake of* Mr YOUNG'S—*Extract from a Kallendar kept by a Farmer in the month of January.*

[In a Letter to the publiſher.]

ALTHOUGH I have always held the name of a critic in contempt, yet when the public, in matters of ſuch importance as eſſays on Agriculture, is preſented with error glazed over with rhetorical decorations, it becomes every lover of his country to trace out and endeavour to explode it. For this purpoſe I ſend you this letter, and ſincerely wiſh you would anticipate any remarks of this kind for the future.

The extract from the FARMER'S KALENDAR in your firſt number, p. 15. ſeems to be a prelude to a complete abridgment of that

that ſenſible performance, tho' I beg leave to add, not complete for any country, nor adapted eſpecially to the Northern parts of this Iſland. There are many of the moſt ingenious obſervations of the beſt Engliſh authors, which, were we implicitely to follow, would lead us into mazes productive of the worſt conſequences. Therefore I wiſh you would give your readers compends of the moſt uſeful papers on huſbandry formerly publiſhed, illuſtrated with your own remarks, adapted to the climate and preſent times, rather than long winded extracts. If you fill your next twelve numbers with the FARMER's KALENDAR *verbatim*, I, as well as another of your readers here, would chooſe to give them up altogether.

Mr

† We are ſorry any of our correſpondents ſhould take exception at our adopting the FARMER's KALLENDAR into our collection. We were firſt adviſed to it by a correſpondent, to whoſe judgment ſome deference is due. And we are happy to find, that our conduct, in this particular, is greatly approved of by ſeverals, and condemned by none, ſo far as we have acceſs to know, but this gentleman and his friend. We introduced it with a proper caution, (Vol. ii. page 15.) and have been, and ſhall be careful, to adopt only ſuch parts of it as may be uſeful to the SCOTS FARMER, leaving out all thoſe which have little chance to be of uſe to him, and are calculated either for the more improved ſtate of farming in England, or for provincial crops, ſuch as madder, liquorice, hops, &c. In general, we muſt beg leave to obſerve, that no rules, or inſtructions, however pointed, can, in farming, be implicitely followed. A variety of circumſtances, which it is impoſſible the writer can have in view, make that impoſſible or improper. Much muſt be left to diſcretion: And if this Kallendar is peruſed with diſcretion and judgement, (and we truſt, we publiſh for the uſe of reaſonable men) we flatter ourſelves, not from our own opinion alone, but from the approbation of others, it may be of great ſervice, not as a directory only, but as a pattern, upon which every farmer may be led to form a Kallendar for his own uſe.

Mr

Mr R. G. in his letter p. 29, diſagrees eſſentially with the beſt farmers, in his directions relative to liming, where he adviſes two years fallow before laying it on; for they univerſally acknowledge, that the more that limed land is plowed, the ſooner it is reduced to a *caput mortuum*, and the lime admitted through the too porous mould, to a depth beyond the reach of the plough.‡

The ingenious Mr YOUNG, has made the following miſtakes in the excerpt taken p. 53. from his Farmers Letters. He charges ſimple intereſt only on the *L.* 71 ſunk on the improvement of the wet paſture; whereas 10 per cent is rather too little. He then calculates the 20 acres at 12 ſhillings; when in reality he has only 6 ſhillings by his own eſtimate. Thus he ſtates 20 acres at 12 ſhillings per acre at L. 240 in 20 years; when it is only 6s. or L. 120. But allowing the land to be worth 18s. after improvement, the calculation will ſtand thus:

Intereſt of L. 71, at 10 per cent, for 20 years	L. 142	0	0
20 acre improved to 8s. in value, for 20 years	160	0	0
The difference is only	L. 18	0	0

10¾d *per* acre *per annum*. And beſides there ſhould be abtracted the value of half an acre, that muſt be allowed to be loſt by the ditches.

If

‡ We apprehend, of the two dangers here mentioned, the laſt the only one to be dreaded: For that limed land is reduced to a *caput mortuum*, only by a ſucceſſive courſe of croping; and that the ground, being kept ſtirred by plowing, is in a fitter ſituation to receive, and be incorporated with the lime, and thereby made ſooner ready for yielding the benefits of the lime: But the ſooner it is laid down to reſt with a crop of graſs, the longer will the benefits of the lime be felt.

If you pleaſe, you may make uſe of the following abridgement of my January Kallendar; and, if agreeable, ſhall ſend you as much every month.

Keep ſheep partly on turnip; allowing them to provide for themſelves in good weather. Litter all ſorts of cattle well, eſpecially penned ſheep, and fatting beaſts. Feeed ſwine on the refuſe of the dairy, kitchen and garden, which ſhould now be trenched; alſo on boiled-parſnip, carrots, potatoes and bran; and the juice of the horſes boiled-meat, and keep them clean. If freſh weather, plow lea; if froſt, cart manure, and make compoſts. Thraſh your corns juſt faſt, as to ſerve your cattle with food and litter. Make ditches and drains; plaſh hedges; catch moles; lay open ant-hills and look well to the forward lambs. Uncover the roots of trees; dung new-planted; and fell all kinds, except reſinous ones. Cut all dead branches off fruit-trees; tranſplant young ones; trench ground, and feed pigeons. Water-graſs lands; cut hedge-rows: lop forreſt-trees; gather ſtones, plant quicks. As the calves of this ſeaſon are generally good, and the milk very ſcarce, they may be fed on the juice of the barley, which many farmers boil to their horſes and cows, on the juice of boiled-hay, mixed with a little flax-ſeed, hemp-ſeed, bran, and $\frac{1}{4}$ part milk. On either of theſe they have been fed in great numbers.

I ſhall conclude, with begging you would give your Reader ſome abſtracts of the acts of parliament which particularly reſpect Agriculture. Your conſtant reader,

PHILAGRO

ARTICL

ARTICLE XXXV.

Query concerning cropping a field.

[From RUDDIMAN'S WEEKLY MAGAZINE]

THE uſe and deſign of every periodical production is to convey inſtruction and amuſement; therefore eſſays and queſtions relative to trade, manufactures or agriculture, are highly uſeful and proper: In the laſt of theſe branches I have hitherto been employed, and I have been induced to give you the trouble of this, to beg the advice of ſome of your ſenſible correſpondents, with regard to the cropping of a field, about which I have ſome doubt: in order thereto I muſt neceſſarily inform in what manner it has been managed for theſe laſt three years.—The ſoil is a light ſharp loam, of a ſouth expoſure, and wettiſh, owing to ſome ſprings or ſpouts, which, as it is a hanging bank, had ſoured the under part of the field ſo much, that it was never known to produce any thing, except in a very dry ſeaſon: the way in which the ridges lay contributed a good deal to make it ſtill more ſo. In ſummer 1771, it was thoroughly fallowed, levelled, and ſtraighted up into narrow ridges; in ſpring 1772, it was ſown with barley and clover, without any dung; the barley, which was ſown thin on purpoſe for the graſs, was tolerably good: care was taken to keep cattle from poaching it in winter; and in ſpring laſt the clover had a moſt vigorous and promiſing appearance, but was greatly hurt by the exceſſive drought of the ſummer.

The crop, however, was thick, and middling good, was cut early, and mixed with ſtraw for winter fodder. The ſeaſonable rains in the end of ſummer raiſed a better ſecond than firſt crop, and which was plowed in with a ſtout fur.

It

It may be neceſſary to mention that, notwithſtanding the fallowing, levelling, and ſtraighting into narrow ridges, the field was far from being thorougly dry; this obliged me, upon the firſt crop of clover being cut, to make it effectually ſo, by running a great many rumbling ſewers through the ſprings or ſpouts, and the water diſcharged from theſe was carried off by a main drain; by this means it was perfectly free from wet; and the fallowing having ſweetened the parts formerly ſoured, it has lain all winter in the moſt dry and healthful ſituation.—Now, Sir, what I want to be reſolved in is, Whether this field, treated as already deſcribed, ought to be ſown with barley or oats for the following crop? If with oats, Whether it would be adviſeable to ſow them on the winter fur, or in what manner? If with barley, the method of preparing for that crop? Clover is again intended to be ſown, and for the ſame purpoſe of plowing in.—Farmers out of the reach of great towns, and ſo ſituated that dung cannot be purchaſed, will (if they are induſtrious) endeavour to ſubſtitute ſomething in its place: and what ſo obvious and eaſily attained (lime, marle, &c. in their proper places excepted) as this method of procuring vegetable manure, of which there is great variety, and which, I am confident, would have an excellent effect, if uſed upon ſoils accuſtomed to town or farm-yard dung?

As the ſeaſon for ſowing oats is at hand, by inſerting this in your firſt number you will oblige ſeveral of your readers in this neighbourhood, who have adviſed differently, but who are all willing to take this method of being reſolved as to the propereſt manner of procedure in this caſe.

Yours, &c.

Fife-ſhire, March 10. *A Practical Farmer.*

THE SCOTS FARMER,

APRIL 1774.

ARTICLE XXXVI.

FARMERS KALLENDAR.

MAY.

Farm yard.

ABOUT the 12th of this month the Farmer may calculate, that he will have a ſufficient bite of graſſes to leave off foddering entirely, and before that he ſhould not think of it; for if cattle are turned into graſs not ſufficiently advanced in growth, they will require ſuch a number of acres, that your mowing ground will be greatly curtailed. As ſoon as your yards are cleared, the dung in them muſt be turned over, and mixed carefully with the ſtuff beneath, whether it be chalk, marle, turf, ditch earth, or whatever ſort; for this purpoſe, you muſt ſet many hands to work on it, ſo as to get it done as expeditiouſly as you can, becauſe it ſhould lie a little after turning, before it is carried on to the land. It thereby undergoes a freſh fermentation, and becomes more rich and rotten. The method in which the men ſhould do this work is, to begin and throw the dung up againſt a wall, or into ſome vacant ſpace, ſo as to have the command of a trench to work in; they ſhould always keep this trench three or four feet wide: Then they draw down with dung cromes the dung, and breaking it to pieces with forks, throw it up on the part already mixed in a ſpreading manner, ſo as to cover all the chalk or earth. In this manner they proceed with the dung, to the breadth of about

eighteen inches, or two feet, till they come to the ſtuff under it; all which they pull down with pick axes or mattocks, and, when it is in the trench, break it further to pieces, ſo as to have it fine; that is, no pieces larger than a man's wriſt. If water hangs in any places in their trench, they ſhould have a water bowl ready to throw it on to the part they have mixed. If this work is well executed, you will have a large hill of excellent manure ready to lay on to the cabbage or turnip land, to be turned in by the laſt earth.

Reſpecting the quantity: Therein lies the proof of your being a good farmer; perhaps the moſt important convincing proof that a farm can offer. If you have managed well, you will have from fifteen to twenty loads for every head of great cattle, and about ten loads for every hogg, not reckoning piggs; not above a third of the whole marle or earth. Every truſſed load of ſtraw, trampled into dung, will make you four cart ones of dung, excluſive of any mixture. The loads I mention are large cart ones of forty buſhels.

But the earth which has layen under the dung all winter, and received all the urine of the cattle, muſt by no means be reckoned as inferior to the dung itſelf. It is become a rich manure without mixing with dung, richer than the beſt of marles: And I am well perſuaded, that this retention of the urine in it, is of ſuch conſequence, that the whole compoſt, when well mixed together, will be better than if chalk or earth had been brought into the yard, at leaſt for moſt ſoils. But that the favourable circumſtances of the conduct much exceeds the expence of it, for all ſoils, cannot for a moment be doubted.

But a very great recommendation of this farm yard ſyſtem is, the cheapneſs of thus manuring land: The farmer will find, that he can in no other method manure, at near ſo ſmall an expence; all purchaſed manures come much higher, many of them five times more expenſive in proportion to their value.

It

In many ſituations there are no manures of any ſort to be purchaſed: in which the farmers, if they do not adopt ſuch a plan as I have mentioned, muſt give their land a poor chance; for it muſt be an admirable ſoil, or a moſt excellent courſe of crops, to render manure unneceſſary.

Cattle in Graſs.

When you turn out your cattle, whether cows, fatting beaſts, or young ſtock, it is highly requiſite to conſider the beſt method of feeding the graſs: There are two opinions on this point directly contrary to each other: 1ſt, It is aſſerted by one ſet of graſiers, that let your graſs to be fed conſiſt of ever ſo many acres, that the cattle ſhould have it all at once; If it is divided into eight or ten fields, the gates of all to be ſet open for the ſtock to feed where they like. 2dly, The other ſet advance, that large fields of 50, 80, or 100 acres ſhould be divided, that the farmer may change his ſtock from one to the other, and give the graſs freſh and freſh. And each of theſe parties aſſert, that they know themſelves to be right from experience. But that is impoſſible; one muſt undoubtedly be wrong. Let us conſider the point from reaſon: It is one that will never be decided fairly from experiment; for two pieces of graſs, each of 80 or 100 acres, contiguous and perfectly alike, are not to be met with in the king's dominions; and if they were, two ſets of ſtock, exactly ſimilar, would not be found. The diviſions into fields by hedges and ditches, for the purpoſes of draining and ſhelter, is not the inquiry, the compariſon not being fair; as ſuch diviſions may be fed at once, by ſetting all the gates open, as well as one field. The inquiry is, Whether the cattle will ſpoil the graſs more in one way than in the other. And whether the graſs will go as far in one as the other, by fatting or feeding the beaſts as well? The argument of giving the graſs freſh and freſh appears to be a vague one; for it ſuppoſes that the cattle will not eat it the ſame, if they have the whole range at once;

which

which is certainly a miſtake: They will not be ſeen in the evening where they were feeding in the morning; but vary their food in the manner moſt agreeable to themſelves. And we may in general obſerve, that the ſagacious animals, when left to their own conduct, manage ſuch points much better than we can for them. As to the treading and ſpoiling the graſs, it is an equal objection to both methods; for I do not ſee any difference; the legs of the beaſts are not tied in ſmall cloſes any more than in large ones.

In caſe all the ſmaller pieces have not water, the objections to feeding them ſeparate are much greater.

Further, in the ſtocking graſs-lands, the farmer ſhould attend well to the proportion between his ſtock and the quantity of his ſeed. Let him remember when he ſtocks his grounds, that he ſhould be pretty nice in this proportion; for if he overſtocks, his loſs will be certain and great; and if he does not throw in as many cattle as he ought, then he will ſuffer in his profit.

There are two principal diviſions in fattening, to buy in your beaſts in October or November, and put them to ſtraw till the end of February: then to begin their fatting on turnips, and continue it through March; from thence to the middle of May on the large Scoth cabbage, and then to turn to graſs, and kill in Auguſt or September The other ſcheme is, buy in ſmaller beaſts the middle of May lean, and fill them fat from the graſs in the October and November following. Where winter-food is raiſed with ſpirit, and the farmer takes a proper care to provide great plenty of litter to turn into dung, the firſt method is much the moſt profitable; but where either of theſe requiſites are wanting, the latter is preferable.

Buck-wheat.

After the 10th or 12th of May to the end of the month, is the proper ſeaſon to ſow this grain. So late a time has offer-

d the opportunity of perfect tillage to deſtroy weeds, and of ourſe the land is fine, and in good order. Plow once more, nd harrow in the ſeed on one earth. It is a moſt profitable rop, and eſpecially on all (except very heavy ſoils,) land hat either requires late ſowing, or that you are diſappointed n the deſign of ſowing ſoon enough to barley. Late ſown rops of the latter grain are ſeldom good enough to pay ex- ences; in ſuch caſes, it is of very great utility to ſubſtitute uck-wheat; for I do not think the ſoil exiſts, on which a rop of buck-wheat ſown in May, will not exceed in value a rop of barley ſown in May; and yet in many tracks of coun- y it is a common cuſtom to ſow barley ſo late as that ſeaſon.

Lucerne.

This is a very good ſeaſon to ſow lucerne in; this graſs be- ng a perrenial, and, when well cultivated, yielding an immenſe profit, too much attention cannot be given to lay the ſeed in he ground with all poſſible advantages; that is, the land hould be perfectly free from weeds, very rich, and as fine as ny onion-bed: now all theſe requiſites a man may not be ble to procure in April. In ſuch a caſe, let him not ſow in April, but wait till May; and this whether you drill or ſow broad-caſt: If the latter, let it, by all means, be with buck- wheat, which is far preferable to ſowing it alone.

Sainfoine.

Sow this graſs alſo with buck wheat: You need not fear ſuc- eſs if your ſoil be proper; for hay in countries where natural meadows and paſtures are ſcarce, ſainfoine is ſo valuable, hat this culture ſhould be attended to more than it is. It s a common notion that this graſs will thrive only on lime ſtone lands, or chalky ſoils; on thoſe that are quite dry, and have at the ſame time a ſtratum of rock or chalk, to prevent he roots penetrating into a wet clay, as it is well known

thoſe

thoſe ſoils have no ſuch bottom. This circumſtance excludes very extenſive tracks in many parts of the kingdom, where ſainfoine would be a moſt valuable acquiſition, but it is much to be regretted, that we ſhould not experimentally know the truth of theſe aſſertions. It is a misfortune, that ſome experiments are not publiſhed to prove, that this graſs will not thrive on gravels, loams, &c. &c. particularly thoſe that are dry. General ideas, the reſult of ages of practice, are admirable guides to tell us, what will do; but they are miſerable conductors in informing us what will not do. The common farmers never blunder in the general practice of the former; but almoſt always in the latter.

Carrots.

If the carrot crop was not hand-hoed laſt month, it ſhould be done this; the men ſhould execute it with four inch hoes, moving along on their knees as directed in April; and thoſe crops which were then hoed for the firſt time, will require an harrowing early in this month, and a ſecond hand hoeing about the laſt week. The harrowing will not damage the young carrots, nor pull up one in twenty; but it will displace the weeds ſet again by rain, and check the growth of thoſe that are got up ſince. The other hand hoeing ſhould be performed with nine inch hoes: The men to ſtand as at turnip hoeing, and they ſhould ſett out the plants to the diſtance of fifteen or eighteen inches from each other. Gardeners do not let them ſtand further than eight or nine inches aſunder. But, when the roots are deſigned to be of a large ſize, that is much too little: The crop will, in very good or well manured land, meaſure more buſhels at a larger diſtance. Theſe obſervations are equally applicable to parſnips.

Potatoes

Potatoes.

Some time during May, the potatoe crop will require a compleat hand hoeing, which ſhould be done with good attention, that not a weed may be left, and the ſurface of the land be left well cut and in fine order. Crops in rows ſhould receive, beſides this hand hoeing, the firſt horſe hoeing which ſhould be given with a common ſwing plough, drawn by two horſes one before another, and turn a furrow from the rows, throwing up a ſmall ridge in the middle of each interval. May is a month that requires theſe operations to be well and attentively performed; for the weeds grow at a great rate, and without ſuch an attention will deſtroy, or, at leaſt, will greatly damage the crop.

Cabbages.

The crop of cabbages planted in April, will require a hand hoeing this month. It ſhould be given only to the tops of the ridges, about eight or nine inches around the plants: The weeds ſhould be cut up clean, and looſe moulds drawn to the ſtems of the plants. In about ten days after, the firſt horſe hoeing ſhould be given, turning a furrow from the plants, and throwing up a ridge of earth in the middle of each interval. This operation will be of great uſe: it lets the ſun into the ridges on which the plants ſtand, and conſequently ſweetens and ameliorates the ſoil, and it kills the weeds that grow on the ſides of the ridges, much cheaper than it can be done by the hand hoe: It likewiſe pulverizes the earth taken away, and expoſes it for ſome time to the ſun, to bring it into fine order for returning to the plants in June, when they will ſtrike into it, and thrive the more for ſuch treatment.

The land deſigned to be planted in June, ſhould this month receive an earth to throw it on to whatever ſized ridges you intend to plant on. This muſt not be omitted, becauſe the

the beginning of the next month will be taken up in carting on the manure.

Wheat Fallow.

If the farmer fallows for wheat, which is however but an unprofitable practice according to the modern ideas of husbandry, the land ſhould receive an earth this month to turn in the weeds that have aroſe on it ſince the laſt The maxim of making the fallows very fine in April, to deſtroy the weeds by a plowing in May, or the beginning of June, is, in general, an excellent one; for how are they to be killed if they do not vegetate? If the fallows are left rough in the common manner, the ſeeds of weeds are ſhut up in the clods: They are broken by the time the wheat-ſeed is ſown; muſt not the conſequences be their growing among the wheat? But it has been urged, that on rich clays this practice will not be proper on account of ſuch ſpring tillage as I have deſcribed cutting in numerous pieces the root-weeds, every bit of which grows; conſequently, you would do as much miſchief in one inſtance as good in another; but being turned up very rough in large clods, the ſun bakes them, and completely kills the roots. It is ever abſurd to reaſon againſt real experience: therefore, if a farmer tries the ſpring tillage, and finds, contrary to expectation, that it fills his lands with pernicious weeds inſtead of killing them he certainly ſhould deſiſt. But I know from the experience of many perſons, that ſuch management as I have mentioned, has totally deſtroyed all ſeed weeds, and proved no impediment to the deſtruction of root ones, by ſucceſſive tillage through the burning parts of the ſummer; not by leaving the roots in poſſeſſion of large clods but turning them up to the ſun in earth ſo looſe with tillage that the harrows draw them out, and leave them ſo expoſed that death is the conſequence. This is the caſe with the graſſes which are among the worſt. Docks, indeed, can h

no way deſtroyed, but by letting them grow, and then digging them up with ſpades, and carrying them clear away from the land.

Horſe-hoed Corn.

Wheat, barley, oats, peaſe, beans, &c. that are drilled on ridges, with intervals left for horſe-hoeing, muſt be well attended to through this month: The rows ſhould be well hand-hoed, and weeded at the ſame time, by the men ſtooping down to pluck out ſuch with their fingers, as they cannot get away with their hoes, without damage to the crop. One horſe-hoeing ſhould alſo be given this month, with the common ſwing-plough, turning a furrow from the plants, which conſequently will throw up a ſmall ridge in the middle of each interval: This kills all the weeds, and pulverizes the earth of the intervals, ready to throw it back by ſucceeding operations to the corn. In this horſe-hoeing, the plow ſhould go within four inches of the rows: If any corn is buried it muſt be uncovered by rakes. In horſe-hoeing peaſe, great care muſt be taken, the trailling branches are not trodden or broken; which ſhould be prevented by banking up the rows, firſt with a hand-hoe, ſo as to make them incline inwards from the intervals.

Sheep.

I ſuppoſe your ſpring-food to have laſted till the 10th or 12th of May: Then they are to be turned into their ſummers graſs, in which you muſt obſerve to manage according to the nature of your ſtock. If your flock conſiſts of lean-ſtock ſheep, whoſe only profit is lamb and wool, except folding, then your buſineſs throughout the year, on whatever food, is to keep them in good and healthy order, but to take care not to fat them, for then you will plainly have too ſmall a flock, and your profit accordingly ſuffer: Theſe flocks are proper for

farms on poor ſoils, which require a large fold, and belonging to which are extenſive commons, waſtes or ſheep-walks: ſuch tracts will only keep the ſheep, but never fatten one.

Another management in incloſed countries is to buy ewes in Auguſt or September, to turn them on to the fallows, or the pooreſt graſs on a farm till Chriſtmaſs, and then to begin to give them ſome turnips or cabbages, keeping them in good heart through the lambing, and afterwards as well as poſſible, that the lambs may be drawn fat by the butcher, ſoon enough to get the ewes fat, and gone by September or October. This is a very profitable practice, and pays the farmer extremely well; but it admits of very little folding, only through the winter on dry graſs-land, and in the ſpring a little. Whether it might be ventured on in ſummer with fatting ſheep, is a queſtion not abſolutely decided at preſent. This purchaſing of ewes, to ſell them and their lambs fat in the ſummer, extends from ſheep a year old, to old ones, called in ſome parts *old crones*.

A third ſyſtem of conducting ſheep, is, to buy in three year old wethers in the beginning of this month; to keep them rather bare till about three weeks after the hay is cleared; during all which time they are folded: Then to give them good keeping by degrees, and from it put them to turnips or cabbages, to fat. Contrive ſo, as not to ſell till March; and keep many of them till the firſt week in May; during all which ſeaſon, they ſell better than at any time in the year. This is a moſt excellent ſheep management; and will pay the farmer as well as any other; and, if his land is good, better than moſt. He may at the ſame time, carry on the ewe ſyſtem, which are ſold fat in autumn from graſs; by which means he may convert his whole farm, if he pleaſes, profitably to the keeping and fatting of ſheep.

Whatever the ſtock is, this is the time for turning them from winter to ſummer food; and you ſhould take care that you have a ſufficiency of clover or natural graſſes for all your ſtock

ſtock. In the diſtribution of it, you ſhould attend particularly to the diſtinction between thoſe ſorts of cattle that do well on clover, and ſuch as require natural paſtures. Sheep, hogs, young cattle, horſes and cows that are ſuckled, are fed to more profit on clover, than in paſtures. But fatting beaſts, large working oxen, and cows that are milked, require natural graſs. It is true, butter and cheeſe are in many places made from clover: But then we do not know whether the prices are not lower. If your clover is good, it will carry five, ſix, ſeven, or eight ſheep an acre, or one horſe; and on ſome lands even more. Good graſs will carry a cow to an acre; but it muſt be above the common run. However, in proportioning the ſtock to the graſs, take care to be rather under than over; becauſe it is an eaſy matter to mow a few acres for hay, in caſe you have too much; but cattle cannot be ſold half fat to advantage.

Folding Sheep.

This month begins the folding ſeaſon throughout *England*; and the practice is of ſuch importance, that it ſhould be ſteadily purſued, in all places that abound with ſtock ſheep. All lean ſheep, and perhaps all fatting ones, ſhould be folded; but the fold ſhould be much larger than for the lean ſtock; and yet they will do as much good to the land, that is go over it as quick; for the benefit from fat beaſts of all ſorts to the land, both in dung and urine, much exceeds that from lean ones. In your folding you ſhould obſerve one point, which is to manure the lands thoroughly. Many farmers give a very ſlight dreſſing: One night in a place, and the fold three ſquare yards per ſheep; inſtead of which it ſhould be two nights, and only two ſquare yards, or but one yard. In a word, the land ſhould be left quite black, if arable; and with a pretty good covering, if graſs. The proper arable lands to fold this month, are the cabbage and

turnip

turnip fallows: Thoſe crops will be ſown and planted in June, conſequently will reap the benefit of the manure directly.

Hogs.

When the farm yards are cleared of cattle, the hogs ſhould be ſorted, and all thoſe of a proper age for feeding on clover, ſhould be drawn and turned into it: This is a part of farming that has of late been much expatiated on; but is not common huſbandry in a fifth part of the kingdom. It well deſerves to be conſidered, which is eaſy to do, as we have of late had pretty clear accounts of it.

In the old management of ſwine they were kept at home about the farm houſe or a cloſe of graſs all ſummer, with times of regular feeding on waſh, grains, or corn, but the error of ſuch a conduct, was making no diſtinction between ſows with pigs, or weaned pigs and large hogs. In the new method all the waſh, &c. is reſerved for the former, conſequently a much larger ſtock can be kept, and the hogs half and three fourths grown, are turned into the clover about the middle of this month; and it is directed that the gates of the fields be lockt on them, and keept there till Michaelmaſs: but for this conduct the fences muſt be all in excellent repair, and a pond in the field for the hogs to drink at. This food agrees wonderfully with them: They grow very faſt, and are taken out of the clover in admirable order for fatting. This practice muſt certainly be attended with very beneficial effects: Enabling the farmer to keep larger breeding ſtocks of hogs, is alone of much conſequence, and cannot fail of greatly improving his profit; the large ſwine will pay for the clover as well as any other application of it, and the conſequence of the whole ſyſtem in raiſing large quantities of excellent manure, cannot be too ſtrongly inſiſted on.

As the dairy will this month afford great plenty of butter-milk and cheeſe-whey, you ſhould reſerve all that is not

wanted

anted for the preſent ſtock of ſows and pigs in brick ciſterns, contrived, that it may run without loſs directly from the dairy nto them: This will be worth many pounds *per annum* in a rm of any ſize: Where ſuch contrivancies are not uſed, the aſh muſt all be uſed as faſt as it is made, and whether wanted not, which is a vaſtly greater loſs than many perſons, not ſed to the improved practice, will eaſily imagine. In thoſe ountries where the ſyſtem of hogs is perfect, they form much e moſt conſiderable part of the Dairy's profit.

Horſes.

The beginning of this month the farmer ſhould leave off y meat for his horſes. Either turn them out to clover, or il them in the ſtable on lucerne; and if he has not lucerne, n clover. This is one of the moſt important articles in his ſineſs: He ſhould therefore conſider it well, that he may here to that practice, which moſt reduces the expence of eping the team, which in general is ſo great, as to eat up lf the profit of a farm.

Food given in the ſtable goes much further than in the ld; and alſo enables the farmer to raiſe large quantities of ng throughout the ſummer. Theſe are both objects of eat conſequence; and if he appropriates a ſmall field of lurne near the ſtable to this uſe, he will find it by far the eapeſt way of keeping his horſes. An acre perfectly well anaged in the drill way, and rich good land, and amply nured, will maintain four horſes, from the latter end of Ail to the end of October: But, if a farmer would manage the moſt judicious manner, he ſhould allot an acre to every ree horſes; by which means he will be ſure to have plenty ſpare for any other uſe.

This ſyſtem of conducting the team cannot be too ſtrongly commended: Thoſe famers who provide graſs or clover to n their horſes into, know well the great quantity of land

that

that muſt be aſſigned them, and the high expences in genera of keeping horſes: They ſhould determine to embrace a methods of lowering ſuch great expences, and none offers mo clearly, and with a greater certainty, than the cultivation Lucerne for ſummer food.

Oxen.

Ox teams are maintained in winter at a much leſs expen than horſes; but in ſummer they are nearer an equality; t ſame reaſoning is therefore applicable to both. It is as advi able to ſoil oxen on lucerne as horſes, they will thrive extrem ly well on it, and at a much leſs expence than paſturing the in the common manner.

Cows.

In this month, the cows ſhould be kept in good food, t the dairy or the calves may return the farmer a due produ Clover and rye-graſs that has been fed off early with ſhe will ſuit them well; but if the clover ſhould, as it is commo ly imagined to do, give the butter a taſte, the variation price ſhould then be calculated on compariſon with the c venience the farmer finds in feeding with that graſs. L cerne does excellently for cows, and gives the butter no taſte: It will, mown and given in racks or cribs, go m further than any food, and at the ſame time yield an oppor nity of raiſing much dung: a point that ought never t forgotten. If this method is purſued, it will be moſt adv able to let the cows go in a ſmall paſture of an acre or t with a pond in it, and be baited on lucerne in the c houſe, or in cribs in a yard adjoining, three times a-day, good care taken that the feeding places are kept well litte In this manner the dairy or calves will not fail of proving tremely profitable. It is not at all neceſſary to aſſert, tha

ws will yield as large a produce in this manner as when rned into natural graſs up to their horns: that is by no eans the enquiry; but there cannot be a doubt of their elding a much greater profit, which is the only point of nſequence. In natural-graſs they will eat, ſpoil, and tram- a great breadth; in exceeding good graſs, perhaps an acre head at leaſt; but if your lucerne is good, one acre will d three or four cows amply. Such a ſtate of the caſe at ce ſhews, that the product of the cows has nothing to do in inquiry: It is the clear profit alone that ſhould be con- ered.

In the feeding of horſes, oxen, or cows, with lucerne, let obſerve, that it ſhould be regularly mown, every day, or ry two days at moſt; and the beſt way of carrying it to ſtable, will be in a ſmall ſkeleton-cart drawn by one ſe, and made for the purpoſe. In the cutting it, the plan- ion ſhould be marked into thirty or fifteen diviſions, one to mown every day or every two days, and the cattle ſo pro- tioned, that they may eat it regularly. This will ſave uble, and make the proportion between the cattle and their d to be diſcovered with the greater accuracy: The lucerne, well managed, will be ready to cut every thirty days.

The Dairy.

Now begins the hurry of the dairy-maid's buſineſs: this is of the moſt tickliſh parts of the farmer's buſineſs, unleſs as a very diligent and induſtrious wife, who ſees minute- o her dairy, or a moſt honeſt, dilligent and careful houſe- er to do it for him, he will aſſuredly loſe money by his ; truſted to common ſervants it will never pay charges. dairy-maid muſt be up every morning by four o'clock, he will be backward in her buſineſs. At ſix the cows t be milked, and there muſt be milkers enough to finiſh by n. The ſame rule muſt be obſerved in the evening.

Cleanlineſs

Cleanlineſs is the great point in a dairy: the utenſils ſhou
all be ſcalded every day; the pails and whatever elſe a
ſmall enough, boiled in the copper daily, and vaſt quantities
cold water ſhould be conſtantly poured down on the floor
hot weather, a cock of water running conſtantly through
falling on the floor, and daſhing a good deal about, wo
have excellent effects in cooling the air. There is ſcarcely
ny part of a farm that wants contrivance more than a dai
if the number of cows be very great; well-contrived con
hiences would ſave half the expence of labour, and pay
farmer amply for erecting them himſelf.

Pare and Burn.

Paring and burning the turff is, in ſome places, begun
ſoon as March; but it ought never to be done till April,
it is better ſtill the beginning of May, at leaſt the burni
but the paring may be executed throughout March and Ap
In the burning, many hands ſhould be ſet at work at on
that a dry time may be caught for it, in caſe the ſeaſon
general proves wet. The aſhes ſhould only be ſpread be
the plough, and turned in immediately: if they are long
poſed to the air, they will loſe much of their virtue.
peculiar circumſtance attending the breaking up of gr
lands, whether old turff or ſainfoine lays, in this manne
the bringing them in order for turnips with only one plow
and it is a general and very juſt obſervation, both in the N
and Weſt of England where this huſbandry is moſt comm
that turnips ſcarcely ever are known to fail on burnt-la
the fly, on ſuch, is totally unknown. Now, any farmer
be ſenſible of the vaſt importance of thus bringing
land, by only one plowing to a turnip crop: an
finity of tillage is thus ſaved, as well as a great exp
and the turnips are always ſo great a crop, that they

e expences of the operation with moſt ample profit. In word, this huſbandry deſerves the warmeſt praiſe.

But of late years an opinion againſt it has prevailed much ſome counties. Several of the nobility and gentry, of very rge eſtates, have interdicted the practice, not allowing their nants to pare and burn under any pretence whatever. The aſon aſſigned for this conduct is, an apprehenſion that the pth of the ſoil decreaſes from it; that you burn the land, d reduce half an inch to half a line; a great evil, when the nd is perhaps only three or four inches deep on a lime ſtone ck. But this reaſoning many very ſenſible and experienced rmers know to be falſe. They, on the contrary, urge the niverſal circumſtance of no land ever being paired till it has quired a turf, which, with natural graſſes, will be about enty years; and with ſainfoine the duration of the crop, hich is from fifteen to twenty years: That it is not the ſoil hich is burnt, but the bulbs of the plants, the roots, and t-work of graſs roots; the earth, which is intermixed, is ver burnt; it is calcined but never reduced to aſhes, all which ariſes from bulbs and roots; hence the fact, that e ſtaple of the ſoil never ſuffers from paring or burning. If is reaſoning be not true, whence the known fact, that ls, not four inches thick, and which have remained at the ſame ickneſs as long as the oldeſt man can remember, have yet en pared and burnt regularly every crop of ſainfoine; that five or ſix times in a century; and as the ſame huſbandry known by record to have been practiſed for ages on the ſame nd, the ſtaple muſt have loſt three inches every hundred ars; in other words, it muſt have been totally gone long o, and nothing but rock remained: all which is evi- ntly falſe, the ſoil at this day being as thick as ever. We ay from hence conclude, what ſuch farmers aſſert to be true, at the earth ſuffers no diminution, thoſe roots and bulbs ly being reduced to aſhes, which in breaking up by the ough alone would rot quite away.

Bees.

Watch well your apiary, for you muſt now expect the bees to ſwarm. This moſt uſeful inſect, is not ſo much attended to by many farmers as it ought: not a farm houſe ſhould be without bee-hives; for the trouble they give is very trifling, and by farmers ſmall profits ſhould not be neglected: the union of them is not trifling.

Hemp.

This is the beſt ſeaſon to ſow hemp in. I ſuppoſe the land to have had its firſt tillage in October, left on the ſharp ridge, and well water furrowed in the ſpring, to have been ſtirred twice or thrice, and well manured. The ſeed ſhould be harrowed in, from two to four buſhels per acre. This plant requires the very ſtrongeſt richeſt land that can be fixed on; for, on poor ſoils, it yields no profitable return. I do not think it is a crop that is in general adviſeable; a good farmer will make money by applying with as much ſpirit to more common articles, as he muſt to this, if he cultivates it at all.

Flax.

This is another culture that requires extreme rich land and great manuring. It anſwers pretty well with due attention, but I may remark on this crop what I did on hemp, that the ſame favourable circumſtances of ſoil, manure, and weeding, would repay the farmer much better in other crops, ſuch as cabbages, potatoes, carrots, &c. &c. with this general and great ſuperiority: hemp and flax are very great exhauſters, where the crops I propoſe, are undoubtedly beneficial to the ſoil, and vaſtly improving to a whole farm, in the quantity of dung they enable you to raiſe. Flax may be ſown in April; but if you have not your land in excellent tilth, it is better deferred till May.

ARTICL

ARTICLE XXXVII.

Of the culture of Clover.

[From DICKSON'S AGRICULTURE Vol. II.]

THE clover, though it is uſed for the ſame purpoſes as the ray-graſs, is however a plant of a very different nature. The roots of the ray-graſs ſpread themſelves near the ſurface, the clover has a tap root, and penetrates the ſoil perpendicularly downwards. The roots of the ray-graſs, by their number and ſmallneſs, bind the ſoil together, and render it firmer; the roots of the clover being large, in growing, open the ſoil, and render it more free. The roots of the ray-graſs, though ſmall, are ſo ſtrong, as to pierce the hardeſt ſoil; whereas the roots of the clover, like all tap roots, though large, can pierce no ſoil, but what is free and open. Theſe qualities of clover, direct us to the ſoil moſt proper for it, and that is one that is deep, free from quickening graſs, dry and open.

A ſhallow ſoil may do for ray-graſs, as the roots of this plant do not go deep: But a deep ſoil is neceſſary for clover, as its roots deſcend perpendicularly, and when they meet with *till*, or any kind of barren earth, by it they are reſiſted; and the plant, not receiving its proper nouriſhment, languiſhes and dies.

Land infeſted with quickening graſs, may be ſown very ſafely with rye graſs ſeed, becauſe ray-graſs binds the ſurface, and ſoon forms a ſward upon it, by which the quickening graſs being prevented from vegetating, is deſtroyed; but clover, on the contrary, opening the ſoil, not only allows, but encourages this weed to extend its roots and propagate: So that land infeſted with it, is improper for clover. If the farmer ſows land in this ſituation with clover, unleſs he allows it to lye till the natural ſward deſtroys the quickening graſs, he

he may expect to find it in much worſe order when he breaks it up again.

Land, though ſtiff and in bad culture, yet, if it is naturally of a good quality, it will carry a good crop of ray graſs; for this plant is a good forrager, and ſearches every part of the ſoil for its food; but clover is a more tender plant, and cannot ſo eaſily ſearch for its food. It puſhes down one principal root, and, if the ſoil is ſtiff, this root is not allowed to grow large, and the horizontal roots that grow up from it are unable to extend themſelves. The ſoil therefore upon which clover is to be ſown, muſt either be free in its nature, or made ſo by proper culture.

Land is always drieſt in the ſurface; unleſs it is of a very ſpungy nature, the rain that falls ſinks downwards, till it is reſiſted by a bed of till, clay, or ſome other hard ſubſtance that does not eaſily admit it, and there it lodges: Hence it happens ſometimes, that land is very wet below, when tolerably dry above. On land of this kind, ray-graſs may thrive very well, as it extends its roots near the ſurface, where the ſoil is in proper order: But clover does not ſucceed, as it puſhes its roots far downward, and hence is chilled by the water that lodges below. Theſe things would happen, ſuppoſing that the clover and ray-graſs require the ſame proportion of water in their food, but it is probable, that the ray-graſs requires the greateſt proportion, and is therefore the better of that degree of wetneſs in the ſoil, that hurts and perhaps deſtroys clover.

There are ſeveral different kinds of clover uſed in Scotland, diſtinguiſhed by the colour of their flowers; and called the red, the white, and the yellow. The flowers of the white and red are of the ſame form, but the flowers of the yellow reſemble the flowers of the hop, and, on that account probably, is ſometimes called hop clover. The red is the largeſt plant, has the ſtrongeſt ſtalks and broadeſt leaves; and the white is the ſmalleſt. The yellow ſometimes grows tall, but the ſtalk is ſmall; this laſt is far from being ſo common as the other two.

There

There are kinds of clover, growing naturally in our fields, that have a great reſemblance to theſe; whether or no they are the ſame ſpecies is uncertain, though aſſerted by ſome writers on Agricuture. The natural red clover, has a very different leaf from the one that is ſown. It is darker in the colour, much rougher in the ſkin, and ſharper in the point. It appears too to be a perennial plant, and to ſpring every year from the root; whereas it is well known that the other is not ſo, and that it cannot, by any kind of culture, be kept alive above 3 or 4 years, and even not ſo long, if it is allowed to bring its ſeed to perfection. Theſe things ſeem to ſhow, that theſe plants are not of the ſame kind. There is another thing that ſeems to confirm this, and which too is of importance to be attended to, in comparing plants with one another: The one kind is greedily eaten by cattle, while the other is ſeldom touched by them, except when compelled to it by hunger. This is the caſe with the kind that grows naturally, and as an evidence of the truth, it is often allowed to flower on paſtures where the cattle have acceſs to it, which it would not be allowed to do if the cattle were fond of it. The other two kinds that are cultivated have a nearer reſemblance to thoſe that grow naturally, and when ſown in ſoils proper for them, are perennial plants, and probably would continue, were they not diſcouraged by the growth of other plants ſtill more adapted to the ſoil and climate, and not ſo much hurt by paſturing.

Various are the ſeaſons for ſowing clover, and as various the ways of ſowing it. Almoſt all the Engliſh authors that treat of this ſubject, recommend the autumn as the proper ſeaſon. Some trials of this have been made in Scotland, but the greateſt part of them, ſo far as I have been informed, have proved unſucceſsful. The reaſons given for preferring the autumn to the ſpring, are, that the land in the ſpring is cold and wet; that if much rain follows, the ſeeds are liable to rot; and, if drought follows, they will not vegetate. Theſe things

are

are very plauſible; and yet clover ſown properly in the ſpring ſeldom fails to come up if the ſeed is good. Sometimes indeed, when it is ſown along with corn, the crop fails by the corn lodging; but very ſeldom from the badneſs of the ſeaſon. And indeed it is natural to expect, that clover-ſeed will come up very well, provided the farmer is attentive to take the time when the ſeaſon is good, and his land in a proper ſituation. While the land is very cold and wet, it ought not indeed to be ſown, but it is in this ſituation only in the beginning of the ſpring; and continued rains to ſoak the whole lands with water, after the ſpring is advanced, are not to be expected; otherways we need not prepare for ſowing ſeed of any kind.

When clover-ſeed is ſown late in the ſpring, ſometimes indeed the drought is ſo great, as to prevent it from coming up immediately: but there is no danger from this. The firſt plentiful ſhower brings it away, and there is no danger of it being deſtroyed, though drought ſhould ſucceed this ſhower, if corn is ſown along with it; for the corn growing upon the field keeps out the drought, and preſerves the ſap. The effect is different when the ſeed is ſown in the autumn by itſelf. In the autumn it is to be ſuppoſed that the land is dry, and being heated by the ſun, whenever a plentiful ſhower comes, every ſeed that has its proper proportion of air, vegetates, but after this ſhower, poſſibly a drought ſets in, which is not uncommon; this drought affects the ſurface, and penetrates deeper than the roots of the young ſeedling have been able to reach; theſe young plants therefore, thus deprived of their nouriſhment, are in danger of being deſtroyed.

But in a matter of this kind, it is vain to argue: Experience muſt be our guide. If it is found from experience, that clover ſown in the autumn ſucceds better in England, than what is ſown in the ſpring; then, without inſiſting upon the

cauſe

cauſe of this, one may ſafely aſſert, that that ſeaſon is the beſt for that climate.

As there are different ſeaſons for ſowing clover propoſed, ſo there are different methods of ſowing likewiſe propoſed. The ordinary way both in Scotland and England, is to ſow it with wheat, or with oats or barley in the ſpring. The ſowing with flax, it is ſaid, is a very good way. Flax is not ſo apt to lodge as corn, and the weeding and pulling is of ſome benefit to the clover. This method of ſowing clover with other ſeed is greatly condemned by ſome authors, who call the farmers ſtupid and obſtinate, for continuing it when it ſucceeds ſo ill. They go ſo far as to aſſert, that it is impoſſible for land to nouriſh two crops at the ſame time. That the ſowing the clover by itſelf may be the better way, is very probable, but it is not the proper method to engage the farmer to follow it, to tell him that it is not poſſible for him to have a crop in the other way, and to call him ignorant and obſtinate, becauſe he ſtill perſiſts. For, ſenſible that he has often had a good crop of clover, though ſown with a crop of corn, he will not allow himſelf to be perſuaded to alter his practice by any reaſoning of the man who poſitively aſſerts things contrary to his experience.

But though the farmer has frequently a good crop of clover, though ſown with oats or barley, yet it is certain, that the corn often hurts the clover, and that the clover ſometimes hurts the corn. If theſe injuries could be exactly calculated, it would probably appear that they exceed all the value of the crop of corn, with which the graſs-ſeeds are ſown. Were we in every caſe more certain of a crop after clover is ſown by itſelf, I could not heſitate a moment to recommend it as the moſt proper way. It has certainly ſome peculiar advantages. We are more certain of having a proper ſeaſon for ſowing. When the clover is ſown along with corn, we are in ſome meaſure confined, for the clover muſt be ſown within a certain time after the corn is ſown. This confine-

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ment is very great, particularly when the clover-ſeed is ſown with barley; for, from the beginning of the plowing, to the laſt of the harrowing of a large barley-field, ſo much time elapſes, that land, which may be in very good order for ſowing the clover at the beginning of the plowing, may be in bad order before the harrowing is finiſhed. Beſides, the nature of the ſeaſon for the barley-ſeed requires, that the land be ſown and harrowed as ſoon as poſſible after it is plowed; and hence if the field is large, it may be ſome days after the barley begins to be ſown upon it before it is ended; and if the ſowing of the clover is delayed till the whole is finiſhed, as is commonly done, one part of the field muſt be in a ſituation ſomewhat different from another. But when the clover-ſeed is ſown by itſelf, the field may be plowed in a proper condition for plowing, and then may lye waiting for a proper ſeaſon for being ſown.

There is another obvious advantage that attends the ſowing of clover by itſelf, and that is, the land, carrying no crop of corn, muſt be in a better condition for nouriſhing the clover in the ſecond year; and we may alſo ſuppoſe, that it will be in a better condititon when brought again into tillage. The weeds that come up along with the clover, would indeed do much harm if allowed to ſtand and ſow their ſeed; but if they are cut down, as can be eaſily done ſometime early in ſummer, this will be prevented, and both the crop and the land be in a better ſituation, than if they had been allowed to ſtand till harveſt, as is done when the clover is ſown along with corn.

But though the ſowing clover by itſelf has theſe advantages, yet I am not certain, but the ſowing it along with a crop of corn, may in ſome ſituations be preferable. It is an objection to the ſowing clover in the ſpring, that if it is late in the ſeaſon and drought follows, it will not come up; or if by a ſhower it ſhould begin to vegetate, it may be caught in that ſituation by the drought, and deſtroyed. When clover is ſown

wn by itſelf upon land that is clean, there is ſome danger
f this; but when it is ſown with corn, there is no danger.
already obſerved, that whenever a plentiful ſhower comes,
he ſeed ſprings, and the growing corn prevents the drought
om penetrating, and preſerves the ſap; whereas, if there was
o crop on the ground, the drought might penetrate again
ſoon as to ſtop the vegetation after it is begun.

I do not chuſe therefore, to give the preference to any of
e ways of ſowing this ſeed above the other, but leave it to
e judgement of the farmer: for whatever may be my opinion,
et I am certain it will be more uſeful, to give ſome directions
bout ſowing it in the ordinary way, than to endeavour to ex-
lode it, and eſtabliſh the other. For nothing can be ſaid ſo
nvincing, as to cure the farmers of what theſe authors
ll covetouſneſs, of ſowing their graſs ſeeds along with a
op of corn: a covetouſneſs not to be condemned, if the
raſs ſeeds are not greatly hurt by it.

As the lodging of corn deſtroys all plants that are be-
w, it is neceſſary when clover is to be ſown, to ſow the
rn in ſuch a manner as to prevent this. It has already been
ſerved, that when there are few plants, the corn is not ſo
t to lodge as when there are many, though the number of
lks ſhould be equal. When the plants are few, there is
ore air below, and this hardens the ſurface; and is like-
iſe uſeful to the young plants of graſs. But when land is
uch infeſted with weeds, the ſowing thin does not ſerve
is purpoſe; for though there may be few plants of corn, yet
ery vacancy is filled up with weeds, and the air is as effectually
ut out, as if the plants of corn ſtood ever ſo thick. To
cure therefore the advantage of thin ſowing, the land muſt
e made very clean *. The farmer can always know, whe-
er or no his land is in this ſituation. However, it is pro-

* See No. II. p. 60 of this volume.

per that he look a little forward, and plan his ſcheme of ma-
nagement in ſuch a manner, that when his land is naturally
much infeſted with weeds, the clover may be ſown ſoon after the
fallow, or even with the crop that is ſown upon it. This is the
moſt effectual means to prevent the clover from being hurt by
the corn, and this is what ought chiefly to be attended to;
for when a crop of clover is deſtroyed, the ſcheme of ma-
nagement which the farmer propoſed to carry on, perhaps for
a number of years, is thereby overturned.

But as the clover is in danger of being hurt by the corn,
ſo the corn is likewiſe in danger of being hurt by the clover.
Sometimes, in a wet ſeaſon, the clover gets a top of the
corn, and deſtroys the crop. This ſeldom happens when the
clover is ſown with barley or wheat, for it is much later
in the ſeaſon when ſown with barley, than when ſown with
oats, and therefore is not ſo far advanced at harveſt; and the
wheat is ſo far advanced before the clover ſeed is ſown,
and grows ſo tall, that the clover can never get above it.
As a means then to prevent the clover from hurting the corn,
it may be ſown early in the ſeaſon upon wheat, or late in the
ſeaſon with barley. I mentioned a kind of barley called
thanet, which, from the ſtrength of its roots and ſtalk, is not
ſo apt to lodge as the common barley; this is the moſt pro-
per barley for the clover to be ſown with.

But as all kinds of barley are more apt to lodge than oats,
the ſeaſon of ſowing oats is more proper for ſowing clover, than
the ſeaſon of ſowing barley, the farmer ſhould ſow the clover
with the oats, when equally convenient. Though the crop
of corn is more certain, when the clover is ſown with the
barley; yet the crop of clover is more certain when it is
ſown with the oats, and the clover is what the farmer, ge-
nerally ſpeaking, has chiefly in view. When the crop of
oats is obſerved to be in danger from the clover, as ſometimes
it is, the farmer may take them in time, and turn the wh-
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into a crop of hay, which may probably be as valuable as the crop of oats, while it is leſs hurtful to the land.

The ſowing clover among a wheat crop is not ſo common as ſowing it with barley or oats. When land is in bad order, and needs to be fallowed, the farmer ſometimes ſows wheat immediately before the fallow; but upon land in this ſituation, it cannot be expected that clover will ſucceed, and it is therefore ſeldom or never ſown. A crop of graſs is not as yet generally thought of ſo great value, as to engage the farmer to ſow graſs ſeeds with the fallow crop, and hence it ſeldom happens that clover ſeed is ſown amongſt wheat. This, however, has been tried, and it ſucceeds very well when the land is in proper order.

When clover is ſown with barley or oats, after theſe grains are ſown, and the land harrowed, the clover ſeed is ſown, and after this the land is again harrowed or rolled. When clover is ſown with a crop of wheat, this is done in the ſpring, and after it the wheat is rolled. It is the common way to ſow the clover ſeed without any preparation given to the land; but it is a better way to harrow the land before the clover is ſown. This makes the roller cover the ſeed more effectually, and the harrowing does no harm to the wheat. If any weak plants are deſtroyed by it, this loſs is more than ballanced by the deſtruction of the weeds, and the opening of the ſurface to admit the air; both which advantages are produced by the harrowing.

Clover ſeed may be ſown in the ſame manner amongſt oats or early ſown barley, and the ſame method may be obſerved. Some time after the corn has come up, the land may be harrowed, and the clover ſeed ſown. If the weather is dry, the different parts of the operation ſhould ſucceed each other as quickly as poſſible. The harrows ſhould be followed immediately by the ſower, and the ſower by the roller, that ſo the drought may not be allowed to penetrate deep, which it is apt to do if the land is not ſoon rolled after it is harrowed.

When

When the ſeaſon is far advanced, this becomes the more neceſſary, as the drought commonly becomes the more violent.

It cannot be poſitively aſſerted, that harrowing does no hurt to barley or oats, after they have been above ground for ſome time. It is certainly in greater danger of doing hurt to theſe crops than to wheat. The wheat land in the ſpring is firmer than either the oat or barley land; and the wheat plants having had longer time to grow, have their roots further extended; ſo that an operation that does no harm to wheat, may poſſibly be hurtful to barley or oats. However, it is not probable that harrowing once over will prove hurtful; this operation has been frequently tried for another purpoſe, and it has always been found to do more good to the crop by the deſtruction of weeds, than hurt by the deſtruction of any of the plants of corn. It is probable therefore, that it may be uſed without great riſk to prepare the land for being ſown with clover, not only amongſt wheat, but alſo amongſt oats or barley.

There is nothing that the Engliſh authors on huſbandry differ more about, than the quantity of clover-ſeed proper to be ſown upon an acre. The authors of the Complete Body of Huſbandry, fix it between 8 and 10 lb. and are poſitive, that leſs than 8 is too little, and more than 10 too much. The author of the New ſyſtem of Agriculture inſiſts for 20, and aſſerts, that if the farmers were not the moſt ignorant and obſtinate of all men, they would be convinced that no leſs quantity is ſufficient. Without paying any regard to what is aſſerted by theſe poſitive gentlemen, I ſhall only obſerve, that the farmers in Scotland, who ſow clover with oats or barley, find, that from 10 to 16 lb. of red, or from 12 to 18 lb. of white on the acre, produces a very good crop.

Clover, like ray-graſs, is ſometimes ſown for hay, ſometimes for paſture, and ſometimes for both. The red clover is the moſt proper for hay, the white for paſture, and when both are intended, a mixture of the two kinds is moſt proper.

When

When red clover is ſown without a mixture of any other kind, he farmer muſt have it in his view, to bring his land into illage again in two or three year. For, after the ſecond year, he crop of this kind of clover is of very little value.

When white clover is ſown by itſelf, the farmer muſt not xpect a crop of hay, for this kind of clover ſeldom riſes to uch a height as to produce a good crop; but then he may ay his account to keep the field long in paſture, for this kind f clover continues till wore out by the kind of graſs that is ore natural to the ſoil.

When a mixture of thoſe two kinds of clover are ſown, me crops of hay may be taken, and then the land may be al-wed to lye ſome years longer for paſture. The red clover ffords the crops of hay, and the white remains till the natu-l graſs ariſes. In this caſe, there is commonly ſown upon e acre from 8 to 12 lb. of red clover, and from 6 to 8 of hite*.

In the climate of Scotland, ſeldom more than one crop of ay in the ſeaſon ſucceeds. The ſecond crop is commonly ſo te, that it is very difficult and troubleſome to get the hay roperly made. It may be paſtured or cut green for cattle, he firſt method is reckoned the beſt, as thereby leſs hurt is ne to the land.

In ſome parts of England, the ſecond crop of clover in the aſon is allowed commonly to ſtand for ſeed. This may poſ-bly turn out to very good account. There are few places in cotland in which the ſecond crop of clover will bring the ed to perfection; and I would by no means adviſe the far-er to let the firſt crop ſtand for this purpoſe. The crop, hen allowed to ſtand for ſeed, may perhaps be much more luable than when it is cut for hay, but that practice would hurt

* Theſe proportions are varied according to the judgment of the rmer.

hurt the land, and prevent the ſowing of clover from being ſuch an improvement, as it is under the preſent management.

When clover is cut green for cattle, it is a proper way to feed them with it upon a field that needs to be dunged. This is better than feeding them in ſtalls; it ſaves the expence of carrying out the dung, and ſecures the greateſt benefit from the urine, which is a very rich manure.

Before this article is concluded, it is neceſſary to obſerve, that red clover, while green, is dangerous to black cattle and ſheep when given them at firſt, eſpecially if wet with dew or rain. When it is intended therefore, that ſuch cattle ſhould be fed upon it, whether it is to be cut for them, or they put upon it to paſture, they muſt be allowed it only ſparingly at firſt, and brought to it by degrees. After being accuſtomed to it for a few days, the danger is over, and they may be allowed as much of it as they can take.

Of Clover mixed with Ray-graſs.

When the farmer needs green forage for his cattle, red clover is the moſt proper for this. An acre of good red clover maintains more cattle than three or four acres of common graſs, but then it is not ſo proper for hay. Clover-hay is very troubleſome in making, and it is not reckoned ſo good for feeding as ſome other kinds of hay; and while the clover has theſe diſadvantages in itſelf; it alſo hurts the land on which it grows in this reſpect, that it greatly encourages the propagation of the quickening graſs, that weed by which almoſt all our lands in Scotland are infeſted. To remedy theſe things it is a cuſtom to ſow rye-graſs along with it. Clover, when mixed with ray-graſs, is eaſier made into hay, and the hay itſelf is much better, and the ray-graſs covering the ſurface prevents the growth of the quickening graſs. It is true, that by this the ray-graſs likewiſe diſcourages the growth of the clover, but this is not reckoned a great diſadvantage. The

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clover meets with little or no interruption in the firſt ſeaſon, and though it decreaſes more in the ſecond than it would have done had it been ſown by itſelf, yet the crop of hay is nothing the leſs, as the increaſe of the ray-graſs is in proportion to the decreaſe of the clover. The quantity ſown upon the acre in this way, is from 8 to 12 lb. of clover, and from 1 to 3 firlots of ray-graſs.

It was obſerved in the laſt ſection, that when it is propoſed that a field ſhall carry ſome crops of hay, and then ly ſome years more in paſture, it is common to ſow a mixture of red and white clover. The adding a proportion of ray-graſs to this is reckoned an improvement. This improves the hay, as has already been obſerved, and it renders the paſture graſs better during the winter, and more early in the ſpring. The quantity ſown upon an acre in this way, is commonly from 6 to 10 lb. of red clover, from 4 to 6 lb. of white clover, and from 1 to 3 firlots of ray-graſs.

ARTICLE XXXVIII.

Of the Impropriety of Tenants incloſing on a ſhort Leaſe, and of laying improved ground not incloſed into Paſture—A Scheme of Crops, by which it is propoſed to feed the Cattle on Cut Graſs only.

[In a Letter to the PUBLISHER.]

SIR,

THE favourable reception you gave my laſt letter, encourages me again to offer you this; in hopes it may be of ſome ſervice to my neighbours, the farmers in Teviotdale and the Merſe, for whom it is principally deſigned.

IF a tenant is poſſeſſed of an arable farm, and caſts about, how to turn it to the greateſt benefit, there is nothing in the whole

whole circle of farming, that will be more advantageous to him, or indeed that he will, by ſkilled farmers, be more readily adviſed to, than to ſtudy ſuch a ſcheme of management, as will, in its courſes, bring him the ſooneſt into good crops of graſs. Theſe are not only very profitable in themſelves; but beſides, he is thereby enabled to carry on all his other buſineſs with eaſe and profit, which, without them, he cannot propoſe to do.

With this view, tenants have been ſtrongly adviſed to incloſe their farms; for without ſubſtantial fences, he can never turn his graſs-grounds to any account.

The preference of land incloſed, beyond what is open and unincloſed, are very properly ſet forth in a letter from your correſpondent A. T. (Vol. I. Art. xxxiii. p. 242). But that gentleman, being very ſenſible, that few tenants can afford to lay out the expence upon a ſhort leaſe, he propoſes an encouragement for them to do it, by having the preſent value of the fences, paid to them by the proprietor at the end of the leaſe. I beg leave however to doubt, if that will be an effectual encouragement: For even, where the proprietor himſelf bears the expence of making the fences, if they are made with hedge and ditch, upon a leaſe of 21 years, which is the common term of leaſes in this part of the country, the tenant can reap very little advantage from them. For the trouble and expence of cleaning, clipping, railing, &c. &c. that attend them for many years after they are made, are ſo very conſiderable, that from the time they become ſenſible, ſo little of the leaſe will remain, that he will not have time to be refunded of the great expence he muſt neceſſarily be out of pocket. In ſome grounds and ſituations, the hedges may become ſenſible in 8 or 10 years: But in general, with the greateſt attention beſtowed upon them, it will be 14 or 16 years before they can arrive to that perfection; and by that time, the tenant muſt begin to prepare for cropping his land

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in ſuch a manner as will turn out moſt for his own advantage.

On the other hand, if the ground is not incloſed, and is of rich and improved quality, the laying ſuch ground into graſs for paſture, is attended with unſpeakable loſs. In a wet ſeaſon, the ground is greatly poached by the cattle; and they do not feed to purpoſe, when that is the caſe. All the corn-grounds that ly next to the paſture-field, is more ſpoiled, than moſt peope are aware of; a ſtrong inſtance of which I myſelf experienced this very year; I had a field of wheat on the outſide of my farm, where a neighbour of mine took the liberty of ſtart and o'er-loup, as it is called, without allowing of which there is no living in good neighbourhood: When the wheat was cut, as the crop was but thin, the damage did not appear conſiderable; and I overlooked the treſpaſs: But having occaſion to thraſh out ſome for ſeed, I took 19 threaves, the produce of two acres that lay next the paſture, from which I expected 9 and a half Berwick bolls; but to my great ſurpriſe and diſappointment, I had no more than 4 bolls and a firlot. If every perſon would keep his corn, that grows next to his neighbour's paſture, or where the fences are in bad repair, ſeparate from the reſt of the field, they would generally find the one-half deficient, even akhough the ſtooks ſtand as thick, and there be no apparent defect while the corn is on the ground. It would be better for them to ſave a few acres of graſs round the corn, than allow either their own or their neighbour's cattle to come near the ſides of the corn: for ſome of them will moſt readily break in amongſt it; the herd and his dog are employed to turn them out without any precaution; and the cattle are thereby forced farther in among the corn, and probably will traverſe the whole before they can be turned; and this frequently when the corn is in the ear, when the loſs will be little leſs than I ſuſtained: for corn being once trodden down, though it may recover a little, yet being once broke, it never fills.

From theſe things I am apt to conclude, that it can be of little or no advantage for tenants to incloſe their land with ditch and hedge upon a leaſe of 21 years; and that to lay improved land that is in good order into graſs for paſture muſt be equally improfitable.

I therefore come now to the point I had in view, namely, to ſhow in what manner, an arable farm may be managed to the beſt advantage, without either incloſing or paſturing: And that, in my humble opinion, may be effectuated by one ſimple propoſition, to wit, the keeping all the cattle at cut-graſs or hay.

I ſhall ſuppoſe the farm to be partly inclined to wet, and partly dry: The firſt thing to be done will be, to ſow a good part of what is in the beſt order with clover and rye-graſs: and to get the outfield thoroughly limed as faſt as poſſible. After this, let the whole farm, which I ſhall ſuppoſe to conſiſt of 300 acres, be divided into twelve equal parts, or as near equal as the lying of the ground will permit. Suppoſe them equal of 25 acres each. Of the ſix diviſions of the dry part of the farm, one ſhould be dunged every year for turnips; and the courſe of crops will be as follows:

1 Turnip - - - -	25 acres
2 Barley - - - -	25
3 Oats ſown with Clover and Rye-graſs	25
4 Clover and Rye-graſs - - -	25
5 Ditto - - - - -	25
6 Oats - - - - -	25
	150

Of the other ſix diviſions, one ſhould be fallowed and dung

ed every year for wheat, on which the courſe of crops will be thus,

1 Fallow - - - - -	25 acres
2 Wheat - - - - -	25
3 Peaſe or Beans - - -	25
4 Barley ſown with clover only -	25
5 Clover - - - - -	25
6 Oats - - -	25
	150 acres

By this means, the crop every year will ſtand thus,

25 acres of - -	Turnip
25 - - -	Fallow
25 - - - -	Wheat
25 - - - -	Peaſe or Beans
50 - - - -	Barley
75 - - -	Oats
75 - - - -	Graſs
300 acres	

According to this courſe of management, there will be a great deal in tillage; but it is pretty evident, that there cannot be ſo much made of the land in any other way, providing it is kept in good order: And if it is dunged every ſix years, and cropped in the way propoſed, it will be always in good condition: the clover crops will contribute to improve it greatly: for as the clover roots go deep, they not only receive the vegetable food that lyes below the reach of the other crops; but they prepare and enrich the ground for the roots of the ſucceeding crops.

Some

Some I know will object and ſay, that there cannot be dung ſufficient in ſuch a farm to go over 50 acres every year, viz. the fallow and turnip land: But I maintain, that if a good ſtock of cattle is kept, to the number of fifty, young and old, at cut graſs during the ſummer, and upon the turnips and the hay and ſtraw of the farm during the winter; and conſidering the great quantity of ſtraw to be employed for litter during the whole year, that a ſufficient quantity of litter will be raiſed to anſwer all the purpoſes intended.

I earneſtly recommend ſhades or yards for keeping and feeding the cattle during the ſummer ſeaſon; for houſes keep them by far too warm: And if they are properly fed, by giving them the graſs freſh cut from the field, they will thrive amazingly better than in moſt of the common paſtures: Twenty five acres of the graſs, if tolerably good, will ſerve the cattle for cutting through the whole ſummer; and feed as many and better than the whole ſeventy five acres in paſture. Thus there will be fifty acres reſerved for hay. But if a ſevere drought ſhould ſet in, as did laſt ſummer, ſo as to prevent the graſs from riſing properly, ſo as to be fit for cutting, the cattle in that caſe may then be turned out to paſture it; as there will not be any of the diſadvantages attending the paſturing this freſh good graſs, where the cattle are ſoon filled, and lye down, without ranging over a great extent of ground.

I muſt caution your readers, that this ſcheme is intended principally for my brethren farmers in Merſe and Teviotdale; for in the Lothians their ſoil and climate is very different from ours, and a different ſucceſſion of crops may be better adapted to them: Beſides, in that country many of the farmers deſpiſe lime, and would not uſe it, though it were to be found within their own bounds; while we think, that nothing can be done without it.

Near Kelſo, R. G.

28*th December* 1773.

ARTI-

ARTICLE XXXIX.

probation of Extracts from the FARMERS KALLENDAR—*Extracts from* YOUNG's *Experimental Agriculture.*

[In a Letter to the PUBLISHER.]

TO the benevolent heart much pleaſure will be afforded, by conſidering the progreſs now making in the knowdge and practice of Farming; and ſurely, if praiſe is due Man, He is entitled to a portion of it, who opens his mind the benefit of ſociety, and ſpreads his experimental knowdge before the Public.

To ARTHUR YOUNG Eſq; how greatly are our King and ountry indebted? His labours are truly uſeful: And alough, in ſuch voluminous publications, and ſuch an imenſe number of rural calculations, inaccuracies will be found; t, upon the whole, they are more correct than could have en expected. I have read moſt of his books, always with light, and never without advantage. His FARMERS KALENDAR is a moſt excellent performance: Accept of my anks, and the thanks of many of your correſpondents from is quarter, for inſerting it in the SCOTS FARMER; and we g, you would continue doing ſo: And although my other Farmer PHILAGROS and his friend can have noing to learn from it, and may be deeper ſkilled in the noble than YOUNG himſelf; yet RUSTICUS intreats, they would t be angry at the publication being continued, as he, with any others, will be the wiſer for it.

With your valuable correſpondent TITYRUS, I wiſh alſo, at you would make extracts from the experimental Agriture. Below, you have a few that I took upon the firſt blication of the book, as I had then the advantage of peing it. I have found them to be right, and the practice is hat I myſelf have adopted.

WHEAT.

WHEAT.

From a variety of experiments it appears, that the mo profitable quantity of wheat for ſeed, to an Engliſh acre ground, is two buſhels and an half; and that the beſt time f ſowing, is from the eight of September, to the twenty four of November. N. B. Land ſuppoſed clean and rich.

BARLEY.

From a variety of experiments it appears, that the moſt pr fitable quantity of Barley for ſeed, to an Engliſh acre, is thr buſhels, upon land fallowed and manured; and five buſhe the moſt advantageous quantity upon common lands. T moſt beneficial time of ſowing is in February and March and, allowing a month later for our Northern ſituations, th is equal to our March and April.

The average product from ſowing in

February - - is - - -	12½
March - - - - -	11½
April - - - - - -	8½
May - - - - - -	6
June - - - - - - -	3½

But here I muſt obſerve, that no farmer ſhould ſow his la ſo early, unleſs it is quite free from weeds, which cannot the caſe, except upon land well fallowed, or after hoed cr thoroughly cleaned. In that caſe, I will vouch, that the ſo ing in March is a ſurer time to have a good crop than t latter months. My barley ſeed is always finiſhed, if the we ther will allow, in the month of March, or firſt week of Apri I never chooſe to be later: By this way I run leſs riſk ſuffering from drought; becauſe ſo early in the ſeaſon, the is never a want of ſap, to make the ſeed ſpring; and before t drough

oughts in June and July ſet in, the corn has ſo covered the l, as, by its ſhade, to keep the ſoil moiſt and cool. The rley I ſow, is that propagated by Sir GEORGE SUTTIE, the Lincoln kind, but exceeding, in beauty and weight, y barley I ever ſaw brought from England. And here let me ake my acknowledgements to that Gentleman, for the real provements in Agriculture he has introduced. This fine rley is entirely his own. And to him alſo we are indebt- for the bean huſbandry, which I have the ſatisfaction of ing, through the channel of the SCOTS FARMER, ſo uni- rſally adopted, to the certain benefit of the farmer, and of urſe to the landlord.

OATS.

The quantity of ſeed oats moſt proper for an Engliſh acre, from ſeven to ſeven and an half buſhels; and the moſt oper time for ſowing, is the end of February or beginning March, anſwering to our March or April.

PEASE.

The quantity of peaſe for ſeed proper for an Engliſh acre, from four buſhels and an half to five and an half.

N. B. The buſhel meant is the Wincheſter, nearly equal the Linlithgow wheat firlot.

CLOVER.

As this is the ſeaſon for ſowing red clover, it will not be proper to mention, how to know the ſeed when good.

In the red clover, there are three ſorts of ſeeds; purple, hite or green, and reddiſh. The purple is the true ripe ſeed; e white or green is the unripe; and the reddiſh ſort is that hich is burnt and ſpoilt, after it has been got: from whence, where

where the ſeed abounds with the purple ſort, it is the moſt valuable.

Mr PRINTER, my turning a writer on Agriculture, is ſurely a reproach to many in my neighbourhood; I am in farming but a man of a day's date, to many around me, whoſe heads are hoary in the practice of the noble ſcience: But why are they ſilent? It is wrong: It is unjuſt. Man was never made for himſelf: The fulfilling of the law of GOD is, Love, firſt to GOD as the gracious and bountiful giver of all Good; and next, to each other. Conſider then, my Friends, that you are not at liberty to keep your knowledge to yourſelves: You are in debt to your ſpecies, and to your Country. Haſte then to pay it, before the end come, and death put a period to all your future purpoſes of amendment.

RUSTICUS

Eaſt Lothian,
May 6th, 1774.

ARTICLE XL.

An ESSAY *on the* MANAGEMENT *of* HOGS; *including Experiments on Rearing and Fattening them*: *By* ARTHUR YOUNG Esq

Part of a Reſolution of the Society for the Encouragement of Arts, Manufactures and Commerce.

—"That Mr YOUNG be deſired to publiſh his account of rearing "and fattening Hogs, with ſuch additions and remarks as he ſhall "think proper."

PREFACE.

IT was my conſtant cuſtom, during five years that I farmed in *Suffolk*, (and has been ſo ſince) to regiſter, in a regular manner, all the experiments I made,—and, from the attention I gave to ſuch matters, every common crop I raiſed became experimental; and all the ordinary management of the buſineſs I found as ſuſceptible of minute calculation, as the trials I purpoſely made. This attentive method of conducting a farm, which can only be executed by a perſon who lives in what may be called abſolute obſcurity, enabled me to regiſter near two thouſand original experiments, upon a vaſt variety of ſubjects.

Among others, Hogs demanded particular attention; and will, in all farms properly conducted, form a principal branch of rural œconomy. I made numerous trials on feeding and fattening them, and with many articles of food not commonly uſed.

The Society for the Encouragement of Arts, Manufactures, and Commerce, offered a premium of twenty pounds, or a gold medal, for the beſt account of rearing and fattening them. In conſequence of that offer, I ſent them a ſeries of trials, as a candidate for their medal, and have been honoured with it.

The account I ſent was incorrectly and ſurreptitiouſly publiſhed, which renders a perfect edition of it highly neceſſary; not only to my own reputation, but in defence of their adjudication of the premium. It is now, by their deſire, preſented to the public, with the addition of ſuch general obſervations as are neceſſary to elucidate the experiments.

Theſe trials are few, in compariſon to the number I made and regiſtered; but a certain brevity, I apprehend, is requiſite in eſſays that are to be read at a public meeeting: this induced me to lay before the Society but a part of what I tried; a circumſtance that ſhould apologize for the many Imperfections to be found in this ſketch.

Of the Management of HOGS.

THE importance of this animal to the farmer is not ſufficiently known in every part of *England*: There are many dairies that do not maintain one tenth of the ſwine they might, with proper management—Several garden roots are raiſed in large quantities, without being applied to feeding hogs;—and clover is cultivated, in many counties upon the largeſt ſcale, without its utility for the ſame uſe being the leaſt known. No perſon, who has tried many experiments in this part of rural œconomics, can fail regretting that ſo many farmers ſhould neglect a conduct that adds ſo much to the good of the public, as well as to their own profit.

There are two principal objects in the rearing and fattening hogs: *firſt*, to make the greateſt advantage of a dairy; and, *ſecondly*, to ſubſtitute ſome other food in the place of that which ariſes from cows, when none are kept.

It is the practice of ſeveral counties to uſe the ſkim-milk, butter-milk, and cheeſe-whey, in *fattening* hogs. This is a pernicious cuſtom; that food, for ſuch a uſe, it is every where known, has twenty ſubſtitutes, viz. peaſe, beans, buck-

wheat

wheat, barley, &c. &c. &c.; but it is not ſo generally known, that pigs may be *reared* without cows. It is agreed, that the dairy food is excellent for the latter purpoſe.

For this reaſon, I ſhall venture to propoſe a different conduct, and with the greater readineſs, as I have found it, by experience, to be more profitable than the common management. The dairy, upon this improved ſyſtem, ſhould be applied only to rearing pigs, and feeding ſows which have young. But this, at once, opens a larger proſpect of the whole management of a farm.

The ſows and weaned pigs ſhould evidently be proportioned, in ſuch a manner to the number of cows in milk, as to conſume all the dairy food without waſte. And other ſorts of food provided for the keeping ſows that have no pigs—hogs half—three-fourths—full grown—and fattening ones.

The practice of ſome counties, as well as the annexed experiments, prove that clover is a moſt capital object in *keeping* all theſe ſorts of ſwine; but thoſe writers, who aſſert that it will completely fatten them, go much too far. There is no ſort of cattle in a farm that require more attention than hogs; any method, therefore, that ſimplifies the management, muſt be peculiarly valuable.

Hogs that are a quarter (or upwards) grown, may be abſolutely confined to a clover field, until it is neceſſary to ſow wheat: nine tenths of *Britain* will doubt this fact, but I have repeatedly experienced the truth of it. The fences, it is unneceſſary to add, muſt, in this ſyſtem, be incomparably good;—which neceſſity, I apprehend, is a particular merit in a mode of huſbandry; for a conduct that forces the farmer to have excellent fences, is, ſo far, of great utility. It is alſo requiſite to add, that there muſt be a pond in the field, which never fails. In a good crop of clover, well fenced and watered, ſwine of this ſort may be locked up from the Middle of May to Michaelmas; and no conſumption of the clover will pay the farmer better: I ſhall add an experiment or two to prove this

this aſſertion; I could inſert many, but a certain brevity is requiſite in ſuch ſlight eſſays as theſe.

I have found lucerne to be equal, and in ſome years ſuperior to clover, for this uſe.—Sainfoine is alſo of excellent utility; but ray graſs and burnet, will not by any means do. Natural paſtures, with waſh, are a good ſubſtitute; but never will be found to equal the artificial graſſes.

But in making the greateſt advantage of a dairy, we muſt not confine ourſelves to the ſummer-keeping alone; proviſion muſt be made for winter-feeding ſuch hogs as do not require aſſiſtance from the dairy.

The following experiments will prove, that carrots, parſnips, beets, and potatoes, are of admirable uſe in feeding pigs that have been reared;—they will keep the hogs that are taken out of the clover in excellent order, and even fatten them—and maintain, to vaſt advantage, ſows that have no pigs.

By this general ſyſtem of management it appears, that hogs are to be maintained the year through upon clover and theſe roots—and recourſe had to the dairy only for aſſiſtance in feeding ſows that have pigs, and in rearing their young.

It muſt be extremely evident, that with this conduct, the number of ſwine maintained on a dairy farm may be prodigious—the number of cows point out the number of ſows and pigs; and theſe again muſt proportion the number of acres applied to the production of clover and roots. Thus the whole chain of crops is connected, and each field the ſupport of the other.

The *ſecond* object, in the management of ſwine, is the ſubſtituting ſome food in the room of a dairy, for rearing pigs; upon ſuch farms as keep no cows, this is an object of very great importance, as there are numerous extenſive tracts of country that will produce clover in very great perfection, and alſo many ſorts of roots, but where it is either unprofitable to keep cows—or only advantageous to ſuckle them.

The reaſon I before gave, viz. keeping this ſketch in due bounds

bounds, prevents the inſertion of numerous experiments, which I formed for the particular determination of this point: I found from repeated trials, that carrots and parſnips will wean pigs of a proper age, almoſt as well as milk;—that is, in ſuch a degree of perfection, as to render the keeping a large number of hogs, upon that dependance, extremely adviſeable to any farmer, whoſe buſineſs or ſituation may prompt him to do it; and other experiments aſſured me, that ſows, with the moſt numerous litters, may be maintained to great profit in the ſame manner. Potatoes, and red beets, I likewiſe found of very great uſe for the ſame purpoſe.

It may not be improper here, to conſider the conſequence of enabling the farmer to keep large ſtocks of ſwine, by means of roots, ſo extremely productive as thoſe I have mentioned: there are no ſoils, but what, with proper management, will yield ſome or other of them; and the crops are immenſe.—The number of ſwine to be fattened or fed by an acre of carrots or potatoes, would ſurpriſe thoſe who have never formed any experiments upon the point: and the excellency of the huſbandry, in general, ſhould plead powerfully with our farmers to adopt it upon this principle. Theſe roots are all fallow crops, that is, they are of the ſame advantage to the ſoil as a year of fallow—and, if cultivated in the manner they ought to be, much ſuperior to any fallow; for this reaſon, their culture is beneficial to the land, and a very material method of bringing it into excellent heart. Their application to feeding ſwine is, alone, ſufficient to improve a farm that is almoſt worn out, ſince it cannot be conducted without raiſing large quantities of the very beſt dung.

Now, the conſequences of adopting the culture of vegetables, that clean and ameliorate the ſoil—and in their uſe infinitely enrich it, muſt be obvious to every reader. It is no exaggeration to aſſert, that the beſt ſoils may be improved, and the poreſt converted into good ones by this conduct;—and I can aſſert, on experiment, cheaper than by any other method. I

have

have found, that 90 hogs will, in fatting, yield as much ma
nure as is worth thirty pounds on the ſpot—and where ſtraw
ſtubble, or fern are to be had very cheap, to a much greate
amount.

It is from theſe ſeveral conſiderations, that I apprehend th
following experiments may be of real utility to thoſe who hav
dairies;—to thoſe who keep cows, but apply them to ſuch
ling;——to thoſe who have no cows, but are willing to kee
ſwine: and, laſtly, to thoſe, who, on any ſoils, are deſirous
improving them.

EXPERIMENT I.

THE firſt week in March, 1765, thirty pigs, juſt wean
ed, were drawn from forty-three, that they might b
all of a ſize; they were then diſtributed into five lots, equall
divided; I do not think there was half a crown difference
the value of them; and then fed with diſtinct ſorts of mea
Each five had a ſtye to themſelves, and all were kept clea
and equally littered with ſtraw.

Lot No 1. Was fed with pollard mixt with water.
2. With pollard, mixt with ſkim milk.
3. With boiled turnips, and pollard mixt with the tu
nip liquor.
4. With boiled potatoes and water.
5. With ſkim milk.

They were kept with this food thirty days. I then turn
them out of their ſtyes (none had died), and viewed them wi
a perſon particularly ſkilled in hogs; the reſult was,

No 2. The beſt,—pollard and ſkim milk
5. Next beſt,—ſkim milk.
1. Next,—pollard and water.
3 and 4.—Equal.

It appears from hence, that pollard and milk are the b
foo

od; milk alone, very good. The other articles advantageous or none of the pigs were in bad order), though not equal the former.

EXPERIMENT II.

At the ſame time with the preceeding trial, four lots of gs, that had been weaned three months, were equally drawn om my farm yard, five in each lot. They were confined before, each lot to a ſtye, and cleaned at the ſame time: eir food was as follows:

No 1. Bran mixt with ſkim milk.
2. Boiled potatoes.
3. Boiled carrots.
4. Raw carrots.

They were kept to this food thirty days. I then viewed them before with the ſame perſon.

No 3. Much the beſt,—boiled carrots.
1. Next,—bran and ſkim milk.
2. Next,—boiled potatoes.
4. Worſt,—raw carrots

Boiled carrots appeared very clearly on this trial to be an dmirable food for hogs of this age; *ſo good*, that I determi-ed to make uſe of this hint in future. Boiled potatoes ap-ear alſo a good food. Raw carrots keep them, I think, bet-r than the farm-yard, but were not equal to the other kinds.

EXPERIMENT III.

January 1, 1766: forty pigs that had been weaned about fortnight, were draughted very equally into eight lots, and onfined each to a ſtye; they were cleaned out, and littered ways on the ſame day, and equally. Their food was as llows:

No 1.

No 1. Raw carrots.
2. Boiled ditto.
3. Boiled potatoes.
4. Pollard mixt with ſkim milk.
5. Ditto mixt with boiled turnips.
6. Malt-duſt mixt with ſkim milk.
7. Skim milk.
8. Ditto, and half carrot water boiled.

They continued upon this food the month of January, and were then viewed; the reſult was as follows:

No 4. The beſt,—pollard and milk.
7. Next,—ſkim milk.
2. Ditto,—boiled carrots.
3. Ditto,—boiled potatoes.
5. Ditto,—pollard and boiled turnips.
8. Ditto,—ſkim milk and carrot water.
1. Ditto,—raw carrots.
6. The worſt,—two dead, malt-duſt and ſkim milk.

Pollard and milk hitherto maintain the ſuperiority; boiled carrots excellent; the reſt almoſt equal, except the malt-duſt which is evidently bad.

EXPERIMENT IV.

In the beginning of June, 1766, I confined ſixty hogs half and three fourths grown, in my hog-yard (a pond's mouth in it), and fed them fourteen days with clover mown freſh every day; it was given in their troughs, with racks acroſs to prevent their ſoiling it. They fell off in their looks in about four days, and grew worſe and worſe, ſeveral dying. At the end of that time, I gave them ſome malt grains and waſh every day, for a few days longer: but the effect was no better, more dying. They were then all turned into the clover field, from whence it had been taken, and confined conſtantly to it for ſome time. Not one more died, for all throve greatly. It will not perhaps be impertinent here to add, that I never found any method of uſing clover more beneficial than thus applying it to the feeding of hogs.

[*To be continued*]

THE SCOTS FARMER,

MAY 1774.

ARTICLE XLI.

FARMERS KALENDAR.

JUNE.

Turnips.

THIS is the great ſeaſon for ſowing turnips: later ſown crops ſcarcely ever arrive at the ſize of thoſe ſown in June. There is a common idea among the farmers, that the turnip ſeaſon laſts juſt a month, a fortnight before and a fortnight after *midſummer*: but let the huſband-man make good uſe of the firſt fortnight, the later will not equall it, unleſs the weather is more favourable. The land I ſuppoſe to have been plowed for the laſt time but one, in *May*: the beginning of this month, the manure ſhould be carted on to it, which, in a well ordered farm, ſhould come from the farm yard; and if that does not yield a ſufficiency to cover a fourth part of the arable land, the farmer is a bad one. If he has a thorough command of litter, and money enough in his pocket to buy plenty of cattle, it will cover a third of it; but whatever quantity of turnips he has, let him dung them well. In this work he ſhould proceed regularly, beginning one ſide of the field, and laying the heaps in lines from top to bottom, it ſhould be ſpread immediately, and the ploughs follow directly to turn it in. Upon that plowing, the ſeed ſhould be ſown without loſs of time, and covered by two or three harrowings, according to the fineneſs of the land. I have ſome-

times ſeen the dung carried out a week before it is plowed in; but that is very bad huſbandry: for much of the goodneſs of it is carried away by the ſun. It ſhould be taken in full fermentation from the heap, and turned directly in, ſo as to ferment under the moulds, which will enſure a great crop. If the farm employs many teams, it will be proper to proportion them, ſo as to let the manuring, plowing, and harrowing, be conſtantly going on without interruption. As to the ſeed, obſerve well, to ſow the great round turnip, that lies quite above ground, and holds to it only by a ſmall tap root, it grows larger than any other, and has the excellent quality of being uſed in winter with much greater eaſe than thoſe ſorts, which root quite below ground, and are conſequently not to be got at in a ſlight froſt. Sow about a quart an acre: leſs than a pint is ſufficient, perhaps half a pint, if they will grow, and eſcape the fly; but I have ſeen many thin ſown pieces totally eaten up, when the thick ſown ones have ſuffered much, and yet enough eſcaped for a crop.

In extreme dry ſeaſons, much ſeed will not vegetate, but ſuch inſtances are rare: the moſt common misfortune is the fly; which eats them off before they gain the rough leaf. Many remedies have been propoſed for this evil; but none that are effectual. Steeps for the ſeed are mere quackery, ſtrewing ſoot over the plants, as ſoon as attacked, will very often ſave them, but the remedy is very expenſive, becauſe on numerous ſoils at this ſeaſon, the ſoot will be of no ſervice as a manure. The very beſt dependance is on the richneſs of your ſoil, if it is extremely fertile, or full of dung, the growth of the turnips will be forced; ſo much accelerated, that they will preſently grow out of the power of the fly. I have often remarked, in fields partly dunged, that thoſe lands, which received no manure, have been totally eaten up, while the dunged parts have eſcaped clear. Without manure, the growth

is

ſo ſlow, that the enemy has many opportunities to attack the plant.

When a crop is totally deſtroyed, the farmers plow and ſow again, which ſhould never be omitted, if you have time. Probably you may do this, and yet get your crop in in June, which will be a fortunate circumſtance attending a firſt early ſowing.

Cabbages.

Upon your cabbage lands you ſhould purſue the ſame maxims as above laid down for turnips, only in plowing the manure in, always throw the land on to the ridge, and ſet the plants in a ſingle row on the top of each: ſo the dung is covered up in the ridges, and the plants in a proper ſituation for profiting by it to the utmoſt. As to the diſtance of the rows, you muſt be guided abſolutely by the richneſs of the ſoil; if you find the plants join from row to row, when at four feet, then you have proof, that they ſhould not be planted nearer; but if they no more than join, on three feet rows, then you would loſe in the crop, if you gave a greater diſtance: two feet from plant to plant, is the proper diſtance.

When the manure is ſpread and turned in, the proper way of planting will be, to ſend women or children in with bundles of plants, to drop them on the tops of the ridges, at about two feet diſtance. They will lye ready for the men, who may then plant almoſt as faſt as they can walk; but if they have to get, carry, and ſet the plants, they will not be able to do near the work they might with better contrivance. The rows at four feet, may be planted at five ſhillings an acre. It is a rule among the cabbage-planters in huſbandry, never to water the plants, let the ſeaſon be as dry as it may, inſiſting that it is entirely uſeleſs. Upon this I ſhall venture to remark, that in moſt

years,

years, if the land is in fine tilth, and well dunged, this may be right, as the expence muſt be conſiderable; but I ſhould apprehend, that in very dry ſeaſons, when the new ſet plants have nothing but a burning ſun on them, that watering would ſave the lives of vaſt numbers, and might very well anſwer the expence, if a pond is near, and the work done with a water-cart.

There is one uſe in cabbages, which appears not to have met with the attention it merits: it is the planting on thoſe lands where turnips have failed. A late ſown crop of thoſe roots ſcarcely ever comes to any profitable amount; but cabbages planted on the land without any freſh plowing, would turn out a very beneficial crop for ſheep late in the ſpring, in all probability (unleſs on very light, ſandy, or limeſtone ſoils) of greater value than the turnips, had they ſucceeded.

No farmer can entertain too high ſentiments of the neceſſity of gaining crops of green winter food: the importance of having ſuch food for his cattle, and not depending totally on hay, is one of the cleareſt axioms in the whole range of huſbandry. His profits will be amazingly leſſened: his loſs in the want of manure felt ſeverely for many years, and on farms not abounding with hay, his expence in buying it, or his loſs in ſelling his cattle will be equally great; but beſides theſe accumulated evils, there is another of a different nature which he ſhould conſider well: it is the change of his courſe of crops. After either turnips or cabbages, he ſows ſpring corn, and with that ſpring corn, clover, on ſome ſoils the graſs is left but one year, in others two, and in others mixed with ray-graſs, three, four, or five. The lay is plowed up, and wheat at once harrowed in. This is at once compendious, cheap, and yet moſt excellent huſbandry; for the whole duration of the graſs is a conſtant fund of profit, at ſcarce any expence, and the preparation for wheat is carrying on all the time in the moſt

beneficial

eneficial manner. But if the turnips fail, and no cabba-es planted, what is the conſequence? Why, the farmer ows wheat on the fallow, in hopes of a good crop, to pay im for ſo much tillage as the land has received. This ntroduction of that grain at once, breaks the whole ar-angement of his farm, and he is forced either to begin gain, or to purſue that pernicious huſbandry of ſowing wo crops of white corn running. He muſt either fallow or turnips again, or take a crop of barley, and then tur-ips: thus is he thrown out of his clover, though as im-portant a crop as any on his farm, and launches into a ſe-ies of tillage, that cannot but prove very expenſive to him, without repaying half the benefit that the clover courſe ould have done.

For theſe reaſons, when the turnips fail, and cabbages re not planted, the land ſhould be laid up in winter for arley, and the clover ſown with it, which will turn out ar more profitable than throwing in wheat.

The cabbages planted in *April*, and hand-hoed and horſe-oed in *May*, ſhould now have the ſecond of each of thoſe perations given: a hand-hoeing the middle of the month, hich muſt cut up all weeds, and break the earth well of he narrow ſlip on which the plants were left. Towards he latter end, the plough ſhould go another bout in the ntervals, ſplitting the ridge thrown up in May, and re-urning it to the rows. Theſe operations will be of very reat utility to the crop.

Carrots.

The carrot crop, will, in all probability, require a hoeing his month, about the latter end of it. It ſhould be per-formed with common hoes, and the men who execute it, hould take good care to kill all remaining weeds, and wherever they left the carrots double before, to ſet them ut to the proper diſtances, this being the third hoeing, the land

land ſhould be left in ſuch order, as to require no more work, or at leaſt, nothing more than once going over it the latter end of Auguſt, to cut up ſtraggling weeds, which may by that time have ariſen.

Potatoes.

Another hand-hoeing muſt be given the potatoe crop, which ſhould be ſo effectually performed as to preclude the neceſſity of any ſucceeding ones; becauſe the plants will be too much grown to be hoed without damage in the operation. The crops planted in rows for horſe-hoeing, muſt have the ſecond this month, given with the ſwing plough as before; it muſt ſplit the ridge before thrown up, and lay it equally to the rows.

Flax.

Weed the young flax; this is an expenſive operation, but the crop depends on it: it muſt therefore be effectually performed.

Lucerne.

The lucerne, drilled in the ſpring, will now want a very carefull attendance. It will not be adviſeable to horſe-hoe it the firſt year, becauſe its great tenderneſs will not bear any accidental evils that may ariſe in the operation; but the hand-hoes ſhould be kept dilligently at work; the land kept throughout this work, perfectly free from weeds, and the ſurface well broken by the hoes, to keep it from any degree of binding. While the men are hoeing, they ſhould never omit to ſtoop and pluck out ſuch weeds with their fingers as grow among the plants in the rows: This is highly neceſſary; for if they are left they will injure the young lucerne much. Whoever cultivates this graſs, muſt abſolutely determine to ſpare no expence in the eradication of weeds: if it is not done in the moſt perfect manner

e crop will anſwer very poorly. There is no plant will ear the neighbourhood of weeds ſo badly, and eſpecially hile it is young. If the hand-hoes are applied in time, nd often enough, the expence will not be great; but if rough ſaving you defer it till they are gotten much a-head, e crop will be either totally loſt, or the expence of clean- g be enormous.

The old crops of drilled or tranſplanted lucerne, will be eady for cutting this, as well as every month through mmer, if the land is made rich enough for it, and the eeds are never allowed to riſe. After the cutting, horſe- oe the rows, each time the reverſe of the former; and in eſpect of hand-hoeing, be guided by the weeds: give it s often as neceſſary to deſtroy them abſolutely and com- letely.

Some cultivators have found a difficulty in the cutting ucerne: They ſay that in mowing it, if the intervals are ept in fine tilth, ſo much duſt is taken up with the rop, that the cattle will not eat it: But in anſwer to his I may obſerve, that if weeds enough are left to pre- ent this evil, the crop will be deſtroyed. It ſhould be ither reaped and laid at once into a cart, or on heaps, or lſe the inconvenience ſubmitted to; which, I might obſerve, annot be any thing like ſo great as ſome people imagine.

Sainfoine.

The latter end of June, the Sainfoine crops will, in ge- eral, be ready to mow: they ſhould always be made into ay; for no graſs in the world anſwers ſo well for that urpoſe. It is a common thing to gain from two to three ons per acre, on dry good land, that with any other crop ould yield none at all: and the after graſs is extremely aluable; much more ſo alone, than the former value of he land.

Clover.

Clover.

The latter end of June, the clover crops will be ready t mow; in many ſituations it will not be adviſeable to fee any more of it than can be diſpenſed with, the hay paying ſo much better.

In the making of all artificial graſſes into hay, particularly clover and Sainfoine, it ſhould be obſerved, to ac quite differently from the making natural graſs. The latter is ſtrewed about ſoon after mowing; but the former ſhould lye in ſwarth a day or two, then turned carefully, and lye a day or two longer. In good weather this makes it ſufficiently. It may then be got into cocks, in which it ſhould remain about two days, and then carted to the ſtack. The whole is a very eaſy and cheap proceſs.

Meadows.

The very early or rich meadows, and the highly manured upland paſtures, about great cities, will be ready to mow in June. In executing the work, obſerve particularly, that the labourers cut as cloſe to the ground as poſſible; graſs never thrives well that is not mown quite clo and the loſs in the crop of hay is very conſiderable; for one inch at bottom weighs more than ſeveral at top. In the making it into hay, you will be a loſer, if you have not many hands ready for the work, it ſhould be ſhaken out directly after the ſcythe; wind-rowed, that is, raked into rows, before the evening, ſhaked out again next morning and in the afternoon got into graſs cocks: theſe ſhould be opened the morning following, and got into the great cock by night, by which time the hay will be well made, if no rain comes; but in caſe of bad weather the proceſs will be more tedious. If ſucceſſive rains come, ſo that the hay is damaged, and you are fearful of its turning out unprofitably, by all means ſalt it as you ſtack it; a peck ſtrewed the layers on the ſtack to a load of hay; it will have a ve

reat effect in ſweetening it, however bad it may be, even blackneſs; and it has been found by experiment, that orſes and horned cattle will eat damaged hay, if ſalted, preference to the beſt.

The Teams.

Continue to ſoil your horſes and oxen in the ſtables, or nder ſheds, upon lucerne mown every day or two, and take are to have great plenty of litter, to ſpread under them, or treading into dung. They will raiſe immenſe quantities f moſt valuable manure, with this management, and at the ame time, be kept at a much cheaper rate, than if turned nto any kind of paſture.

Horſe-hoeing.

The drilled crops, in general, of wheat, barley, oats, eaſe or beans, muſt be horſe-hoed, at leaſt once in June. f they had received a firſt horſe-hoeing in May, then this f June muſt reverſe it: throw the earth back again to he rows, ſplitting the ridge in the middle of the interval. n theſe works of horſe-hoeing, two horſes ſhould be uſed, ne before the other, and the plough ſhould not be carried earer the rows of corn than four inches: even at that iſtance ſome of the corn will be apt to be buried. Theſe emarks are offered for thoſe, who drill all ſorts of crops; ut the new huſbandry cannot be recommended for white orn or peaſe: beans it is incomparable for; turnips it is aid to do well for.

Fallows.

The fallows, whether for wheat or barley, ſhould this month eceive a ſtirring; by which the crops of weeds, that have ariſen ſince the land was plowed and harrowed fine, the

latter end of April or the beginning of May, will all be turned in and deſtroyed: no other tillage will be requiſite this month to them.

Buck-wheat.

In caſe the month of May was very unfavourable to the tillage of ſpring corn lands, buck-wheat may yet be ſown; but it ſhould not be ventured in the ground after the firſt week or ten days. This crop bearing to be ſown ſo late is, in many caſes a moſt valuable circumſtance. By means of it, you have time to get the land into extreme good order, and quite free from ſeed weeds. If the ſtubbles are broken up in October, he muſt be an indolent farmer, that cannot get his land fine and clean by the end of May.

Sheep.

In this month the flocks of ſtock ſheep are regularly managed: They live on the commons and ſheep walks with little change or trouble. The ſtock intended for fatting; ſuch for inſtance, as wethers bought in in April or May, and intended to be ſold fat from turnips or cabbages the following winter, ſhould be kept not like fat ſheep but throughout this month on the pooreſt of your food: they may be turned on to your commons or ſheep walk, or into your bare paſtures, and kept ſo for eight hours a day and then give them a bait for two or three hours in your clover or ray graſs, or good natural paſtures; after which they will be ready profitably to fold. Early in the month the lambs of a flock ſhould be gelt: a work that ſhould not be delayed longer.

Now alſo is the time for ſhearing ſheep. In this work the young farmer ſhould be attentive, and fix on the ſtea dieſt and moſt carefull of his labourers for it. If he do not keep a ſhepherd, they muſt be waſhed in a pond or river three or four days before, taking the opportunity o

warm day. Two men hold the ſheep, and waſh his wool quite clean; and another or two muſt attend to bring them. The only rule in doing this work, is, to waſh them till the wool is quite clean and white. Some people have a notion, that it will kill the fiſh of a pond; but this is a mere vulgar error: on the contrary, the vermin that are waſhed out will feed them well.

In a day or two after the waſhing, they muſt be ſheared, in which buſineſs the principal care is to ſee, that the men do not ſtick the points of the ſhears into the ſheep, nor clip or wound the ſkin. A man that underſtands the buſineſs well ſhould attend to wind the wool into fleeces as faſt as it is cut, and ſhould take care to turn in all the damaged or ill looking parts, ſo as to make as handſome a fleece as he can: The farmer will find the advantage of ſuch a conduct when he ſells his wool. In ſome countries, the whole buſineſs of waſhing, ſhearing, and winding is done by the great: the price varies; but it is three ſhillings and ſix pence a ſcore of ſheep, where the men have one ſhilling and ſixpence a day at that ſeaſon of the year.

Folding.

This is a capital month for the ſheep fold, and the benefit of this manuring is ſo great, that he is an idle farmer who does not make the moſt of it. Now you ſhould fold the cabbage and turnip land, which are the crops that will ſooneſt ſucceed the operation: the general rule for all manuring. Give each ſheep a ſquare yard in the fold, and go two nights on the ſame land. After your cabbages are planted, and your turnips ſown, if the land is very light, continue the folding on the turnips till they come up; but, after that, you muſt remove to your crops of graſſes, that are mown regularly for ſoiling your teams within the ox-houſe and ſtable. As ſoon as a ſpot is mown, fold it, but only one night, and immediately after horſe-

hoe

hoe it. If the rows are too narrow for that operation, hand-hoe it; and if the crops are broad-caſt, harrow it. But whatever be the operation, it ſhould follow the ſheep ſo as to bury the dung directly. This uſe of the fold will laſt till about a fortnight before wheat ſowing, when you ſhould move again.

Thiſtle the Wheats.

In this month, the crops of wheat, if any thiſtles have ariſen in them, ſhould be weeded. The beſt manner of performing the work is with a ſmall hand-hook. It ſhould not be deferred longer than the beginning of June, or damage will be done to the crop by the treading.

Dig Marle.

This is a good ſeaſon for marling of land: one of the moſt important works that can be done in huſbandry. All farmers that have marle under their fields, and do not make uſe of ſuch a treaſure, are much to be pitied; it may be called the Prince of manures.

In ſome countries, it is the common manure; and almoſt every where to be found when dug for; in ſuch places the farmers have nothing to do, but to get money enough to reſolve on the undertaking; they all acknowledge the expediency of the work, and ſeldom diſpute the great profit of it; but in other parts, the knowledge of marle is very confined. It may perhaps be diſcovered half a century before it comes into general uſe. In tracts of waſte land, or ſheep-walks and warrens, let at a ſhilling or two ſhillings and ſixpence an acre, marle being diſcovered, and rendering ſuch land capable of yielding noble crops of turnips, clover, and all ſorts of grain and pulſe; the uncommon effect, and the amazing advantages made by it, are ſo ſtriking, that the uſe ſpreads faſt. But on the contrary, when marle is found under richer ſoils,

(incloſed

inclosed countries, for instance, of 10 or 12 shillings an acre), the case is different: it will make no such improvement, as on the poorer lands; and as great fortunes are not suddenly made by the use of it, the farmers will not be persuaded to use it with any spirit, possibly not at all: they think, that a rent, comparatively higher than the other tracts, will not allow of their spending such sums about it: that they will not reap equal profit is undoubted, but why not accept of twenty per cent advantage? should they reject it because they cannot command fifty? If tenants are backward in making use of marle in lands of 10 or 12 shillings an acre, their landlords should set them the example, and shew them that the work will answer well.

Marle is of various sorts, and lies in various strata: in some places it is a soft, fat, soapy substance; in others, it is hard as chalk, which are called stone-marles: sometimes you find it white, sometimes grey; also blue, yellow, and a dark brown. In some counties you have shell-marle, which is composed of nothing but marine shells. The depths at which it lies are various: sometimes only three feet from the surface, at others ten or twelve, and in some places so deep, that it will not answer to get it at all. The strata are also of different thickness from two feet to twelve feet deep; but the general circumstances in which all true marles agree, and which denote them to be real, are the effervescence with acids and the falling in water. The crackling in the fire is a good sign, but not alone determinate.

If it is uncertain what strata are under a farm, it is ever advisable to use the screw-borer, to discover what soils are within reach. By means of that instrument, you discover, at a trifling expence, if there is any marle at command.

The best way of conveying it on to the land, if it does not lie very deep, is to open a sloping mouth, sinking the pit gradually, wide enough for a cart to drive in and out; and when

when you come to the marle, to work it away circularly, and to keep the pit ten or fifteen feet deep, by which means the expence of filling the carts will be much leſſened. The expence of marling, when it is thrown in this manner into the cart, will be, upon an average, three pence half-penny per load of 30 buſhels, the filling and ſpreading; and about four pence-halfpenny for the teams, carts, and drivers: in all, eight pence per load, or L. 3 · 6 · 8 Sterling per hundred loads. This will be a proper quantity for an acre of land: The benefit will laſt for twenty years, and the land always be the better for it.

Where the marle lies too deep for this work, pits are ſunk like wells, and the marle drawn up in buckets: This will coſt alone ſix pence *per* load of 20 buſhels, or nine pence that of 30, which added to the eight pence of the above makes one ſhilling and five pence in all; or for 100 loads L. 7 : 1 : 8, which is the amount *per* acre. This expence will be thought high only by thoſe, who have been uſed to the inferior one of L. 3 : 6 : 8; but in reality it is one of the cheapeſt methods of manuring land: for, conſidering the number of years the manure laſts, the price *per annum* divided will amount to a very ſmall ſum annually.

Dig Clay.

Where marle is not to be had, clay, in many places, is to be found at a moderate depth. This manure has none of the properties by which marle is to be known; but yet it works wonderful improvements on many ſoils. In ſome light lands it has been preferred by many very good farmers to indifferent ſorts of marle; and this preference has been the reſult of attentive experience.

But the great point concerning clay is not ſo much the compariſon with marle, as the uſe of it where no marle is to be had.

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On all light ſandy ſoils it ſhould be uſed with a confidence of ſucceſs; for the precedents of its good effects are ſo numerous that they have not a doubt of its excellence. About one hundred loads an acre, at the ſame expence as of marle, will work an improvement great enough to ſhew how much miſtaken they are, who think nothing but the fineſt marles worthy of attention; and upon heavier ſoils, ſuch as wet loams, brick earths upon clay, and looſe hollow ſoils, that want a firmer texture, clay is an excellent manure; but there are vaſt tracts of ſuch land that cover very fine veins of clay, and yet the farmers know nothing of the uſe of it. It is much to be regretted that their land-lords do not give them a juſter idea, by being at the expence of claying ſome ſmall fields, until the benefit of the improvement becomes conſpicuous.

Empty Ponds.

This is a proper ſeaſon for emptying ponds, and cleanſing rivers; for, being early in the ſummer, you will afterwards have an opportunity of turning the mud over twice or thrice; and thereby ſweetening it, and laying it into the proper ſtate for bringing it on to the land. This is a part of huſbandry too much neglected by moſt common farmers, but advantage ſhould always be taken of it by a good huſbandman, when he is lucky enough to ſucceed a great flood; for then he will probably find all the ponds, &c. full of rich mud.

It is impoſſible that pond mud, eſpecially if there is a ſtream into the water, ſhould ever fail of proving a moſt excellent manure, when judiciouſly uſed. The method of managing it which has been found the moſt beneficial, is the following.

As ſoon as the mud is dry, and hard enough to ſpit, turn it over, and, in about three weeks or a month after, mix it with

with an equal quantity of chalk or marle: it matters not which you move: either bring the chalk to the mud, or carry the mud to the chalk. If lime is cheap and plenty, it will be an excellent management to add about half the quantity of mud in lime. Let the whole be mixed well together, and remain until September, when it ſhould be turned over again, and ſpread upon paſture or meadow land in October. This is huſbandry that will pay any man well.

ARTICLE XLII.

Of the culture of Sain Foin, or St Foin.—Of the culture of Lucerne.

[From DICKSON'S AGRICULTURE.]

THIS graſs is, by thoſe that treat of Agriculture, reckoned much preferable to clover in many reſpects. The crop they ſay is larger; when eaten green it does not hurt cattle, it makes better hay, and it continues four times longer in the ground. When, to theſe advantages it is added, that a good crop of this graſs will grow upon land that will bear no other, one cannot help expreſſing the greateſt ſurprize, that all this ſhould be true, and yet that the culture of St Foin ſhould make ſo little progreſs in Scotland. Good graſs is almoſt as valuable here as in England. We have enough of bad land, and yet we have little or no St Foin. I moſt acknowledge, that I am ſometimes almoſt tempted to think that the authors, who treat of agriculture, borrow the conjectures of others, much more frequently than repreſent facts upon repeated experience. I muſt however do Mr Mortimer the juſtice to obſerve, that he does not pretend to any certainty in this point

oint, and delivers the opinions of others rather than his wn.

As we have ſo little of this kind of graſs in Scotland, it annot be expected, that any directions can be given about he manner of cultivating it founded upon experience. All hat I propoſe, is, to make ſome obſervations upon the facts nentioned by the authors that treat of this ſubject, and eſerve the greateſt credit.

St Foin is a plant that has a very long tap-root, which is ble to pierce very hard earth, and which ſometimes puſhes ſelf downwards even into the clifts of a rock. Mr TULL ys, that "He was informed by a perſon of undoubted "credit, that he had broken off one of theſe roots in a "pit, and meaſured the part broken off, and found it "fourteen feet." The ſame author mentions a vulgar pinion, which is, that "St Foin will not ſucceed on any "land where there is not an *under ſtratum* of ſtone or "chalk to ſtop the roots from running deep, or elſe they "ſay the plants ſpread themſelves in the roots only, and "cannot thrive in thoſe parts of them which are above "ground." But, inſtead of expoſing the abſurdity of this way of reaſoning, as Mr TULL has done, it would have een better to have diſtinguiſhed betwixt the opinion and he reaſon adduced in ſupport of it; for theſe are very dif- erent. The opinion may be well founded, though the eaſon adduced is abſurd. The opinion may be ounded upon repeated experience and obſervation; while he reaſon may be nothing but a conjecture of ſome perſon, rying to account for an appearance in vegetation, that is a ittle uncommon. It ſeems to be allowed by all, that St Foin delights moſt in a dry ſoil. Deep ſoils, eſpecially thoſe hat have an *under-ſtratum* of clay or tile, are generally wet t the bottom; this wetneſs deſtroys the St Foin; and this ay have occaſioned the opinion, that this graſs does not ucceed on deep ſoils. On the other hand, land that has

an *under-ſtratum* of ſtone or chalk is generally dry. On this ſoil then the St Foin plants naturally thrive at firſt, and puſhing their roots down through the clefts of the rock, and receiving the vegetable food that the rain naturally carries into theſe, continues to increaſe, and at laſt comes to the greateſt perfection. Perſons obſerving the St Foin flouriſhing on this kind of land, and not knowing that it puſhed its roots into the clefts of the rock, might conjecture, that the reſiſtance which its roots met with from the rock was the cauſe of this.

The roots of St Foin, properly nouriſhed, grow very large, and the larger they are they penetrate to the greater depth; and hence we may conclude, that the St Foin that thrives well receives a great part of its nouriſhment from below the ſtaple of the ſoil. Mr TULL mentions nine tenths; but this, except in ſome very particular caſes, is certainly too much. Numbers of experiments however diſcover, that the roots of plants extend themſelves in proportion as they find proper nouriſhment. There is no doubt therefore, that the roots of the St Foin find nouriſhment, even at the great depth to which they penetrate.

This points out to us, not only that deep ſoil, or ſoil that has a bottom through which the roots of the St Foin can penetrate, is the moſt proper ſoil for this kind of graſs; but alſo that it is of the greateſt importance, to cultivate it in ſuch a manner as to render the plants moſt vigorous. To render the plants of St Foin vigorous, it ſeems neceſſary that there ſhould be but few of them. Then ſowing alone does not anſwer this purpoſe. By it indeed there may be as few plants of St Foin as one pleaſes; but this of itſelf does not make the plants vigorous, even upon a ſoil that may be proper for them. There are very few fields that are not infeſted with weeds of ſome kind or another. Theſe come up along with the St Foin when it is ſown, and hurt the plants as much as if the St Foin itſelf was

thick

hick ſown. It ſeems neceſſary then, that the ſeed be ſown in ch a manner as to render it eaſy to deſtroy the weeds that ome up along with it. The ſowing it in rows by a drill without doubt the moſt proper method for this; for then ot only the weeds, but alſo the ſupernumerary plants, can ſily be removed.

It is ſeveral years before St Foin comes to its full trength; and the number of plants ſufficient to ſtock a eld, when it is in this imperfect ſtate, will make for the firſt ear or two but a poor crop. It ſeems neceſſary therefore, hat it be ſown in ſuch a way as to make it eaſy to take up lants in ſuch numbers, and in ſuch order, as always to eave the proper number in their proper places in the field. The ſowing in rows at proper diſtances, by the drill, is likeiſe the proper way of doing this. Suppoſe that a field is drilled in rows at ten inches diſtance, the partitions may be and-hoed, and the rows dreſſed in ſuch a manner as to eave a proper number of plants. In this ſituation the field ay remain two years. Then one fourth of the rows may e taken out in pairs, in ſuch a manner as to make beds of ifty inches with ſix rows in each, and intervals of thirty nches, which may be plowed. Next year, another fourth of the rows may be taken out in the ſame manner, ſo as to eave double rows with partitions of ten inches, and intervals of thirty. All of which may be hoed, or only hoed lternately, as found moſt proper

The great quantity of this graſs, which the authors that reat of this ſubject aſſure us may be raiſed upon an acre, nd the great value and excellency of the hay made of it, ſhould certainly engage ſome perſons to be at ſome expence in making a compleat trial, and even to make uſe of the ſpade inſtead of the hoe, or hoe-plough if neceſſary. In this caſe, inſtead of taking up two contiguous rows, the intervals to be hoed by the plough, every fourth row may be taken up, and the intervals dreſſed by the ſpade, and

after-

afterwards the other proper rows taken up as found most convenient, till the field is left in the ſituation as mentioned above, in double rows of ten inch partitions, and thirty inch intervals. Several other methods of leſſening the number of rows might be mentioned; but theſe will naturally occur to every perſon who makes the trial when he inſpects the field.

The plants taken up from a field of St Foin may be ſet in another field; and if the tranſplanting of St Foin ſucceeds as well as the tranſplanting of lucerne has done with Mr Lunin de Chateau vieux, the trouble and expence of this will be ſufficiently ballanced by the largeneſs of the crops. There is this particular advantage that may be expected to attend this: The St Foin may thereby be made to thrive on land unfit for it when ſown. In tranſplanting, it is neceſſary to cut off a great part of the long tap root; this prevents it, after it is put into the ground again, from ſtricking very deep, and makes it puſh out large roots in a ſloping direction, from the place where the tap root is broken; and the St Foin, thus managed, may thrive on land that is ſhallow, or has a wet bottom, provided it is not overſtocked with plants. M. de Chateau vieux found, that this happened to the lucern which he tranſplanted; and there is ſcarcely any reaſon to doubt, that the ſame will happen to the St Foin.

Any perſon that propoſes to try the culture of this graſs, does not need to have it told him, that he ought to be at the greateſt pains in preparing the land for it, and particularly in making it as free of weeds as poſſible. The great value of the crop ſhould naturally induce him to this.

I am very ſenſible, that many farmers muſt be deterred from attempting to raiſe this graſs, by the trouble and expence that muſt attend it. However, it muſt be remembered, that no new thing can be introduced without both

theſe

hese; and if this plant is of half the value, that thoſe that reat of the culture of it repreſent; the farmer that introduces it into any part of Scotland, will not only reap great enefit himſelf, but do an important ſervice to his country.

Of the culture of Lucern †.

This graſs, as well as St Foin, we have originally from rance. It is the ſame with the *medica* of the ancients. The reat encomiums given this plant by authors, both ancient and modern, juſtify us in making a very particular enuiry into its culture, to try if it is poſſible to introduce it nto this country.

There are indeed, ſome ſpots of it to be ſeen in different places; but theſe are not much more frequent than hey were twenty years ago; ſo that it would ſeem, that he farmers are ſtill of opinion, that the crop does not verballance the trouble and expence of raiſing it; but had hey the expectation of being able to raiſe a crop, nearly qual to what this kind of graſs is ſaid to produce, and which t certainly has produced in other countries, there is ſcarcely one perſon that has opportunity, that would not make the rial.

This graſs was called by the Romans, *medica*, becauſe t was conſidered as a remedy for ſick cattle, and ſmall uantities are at this time cultivated in Switzerland for this urpoſe; or rather perhaps, becauſe it was brought from Media during the Perſian wars in the time of Darius, as Pliny

† Though this plant is hitherto cultivated in this country for curioſity only, yet the apology made by our author in his firſt paragraph, for treating of it, will ſufficiently excuſe us for taking this chapter into our collection. As it is a curioſity, to omit might be reckoned blame worthy; and ſome more adventurous farmers may be induced to try ſome experiments of it on a larger ſcale, than has hitherto been attempted in this country.

Pliny informs us. Columella ſays, that a *Jugerum*, which is leſs than half a Scots acre *, was ſufficient to maintain three horſes for the whole year.

Paladius likewiſe aſſerts the ſame thing. A late author ſeems to think, that theſe Roman authors have exaggerated a little, as the methods of cultivating lucern are now improved, and yet no ſuch large crops produced. In ſupport of this, he ſays, that a huſbandman among the Romans allowed 20lb of lucern hay at night only to a working ox. And ſuppoſing the ſame quantity to be given to a horſe, the crop becomes altogether incredible. Cato directs, that 18 lb. 12 oz. of hay be given to each ox at night; and Columella informs us, that 30 lb. in the day is ſufficient for an ox, in the ſeaſon of his ſevereſt labour. But the hay mentioned by this author is not lucern, but common meadow hay. For after obſerving, that in dry countries the oxen muſt be fed at their cribs, with ſuch food as the country affords, he mentions the kinds that are reckoned beſt, among which he places meadow-hay. It ſeems paſt all doubt, that Cato means the ſame kind of hay, as he does not treat of the culture of *medica*, nor ſo much as mentions it. Mr Lunin de Chateau vieux in the environs of Geneva, as ſhall be afterwards ſhown, raiſed crops of lucern, at the rate of 8480 lb. of hay upon the Jugerum, which affords near 24lb. for each day through the whole year; and this, according to the trials made by the ſame gentleman, is ſufficient food for three horſes.

M. Lunin de Chateau vieux ſays, that from an arpent of land, which is about 1.008 parts of a Scots acre, in the environs of

* A Jugerum, according to Columella, contained 28800 Roman feet. A Roman foot is equal to 11,604 Engliſh inches; ſo 28800 Roman feet are equal to 26930 Engliſh feet. The Scots acre contains 54760, the half of which is 27380, which is 450 feet more than the Jugerum. A Jugerum is nearly 490. of a Scots acre.

f Geneva, planted with Lucern, he had of dry hay, lb.

In the year	1754	15300
	1755	13396
	1756	17108

This is nearly in the proportion of eight tun upon the Scots cre. But this is not all; This gentleman represents the ay of this grass as infinitely superior in quality to the comon hay; and expressly declares, that his horses, fed partly ith the common hay, and partly with this hay crop, were in etter order than when fed with common hay and oats. He ys, it was his custom to feed his horses upon this hay in the mmer season, when their labour was most severe He adds, at five or six *libs* of it in a day are sufficient for an ordinary orse. This, however incredible it may appear, is yet past all oubt, as the great exactness of this gentleman, in every thing hich he has undertaken, renders his authority unquestinable.

This grass has another quality; it lasts very long. Columella says ten years, Pliny says thirty years. The common opinion is ten or twelve. M. de Chateau vieux, after ome years experience, says that he does not know where s increase will stop; and Mr Tull mentions a plant in his wn fields, that had stood 22 winters, and yet remained as trong as ever. As almost all the fields of lucern that ave failed, have been destroyed by the natural grass, it is mpossible to determine how long it may continue, if freed rom this enemy.

One would think, that the prospect of so valuable a crop hould engage the farmer to make a complete trial. For, fter paying all the expence that we can suppose the cultivating an acre of land in the highest manner can cost, et still the crop must bring more profit to the farmer, than ny other he can raise. But however, before it can be expected that he will engage in this expence, it is but reasonable that he should see a probability of raising a tolerable crop.

Different

Different plants are adapted to different climates, and therefore the having a valuable crop in in one place, does not make it even probable, that a valuable crop of the ſame kind of plant may be raiſed in another place where the climate is different. But then it muſt be obſerved, that this plant has been tried already in this climate, and it is found, that when the ſeed is good, it comes up very well, grows and ſtands the winter froſt. This makes it evident, that a crop of this graſs may be raiſed in Scotland. But the queſtion is, Whether the difference of our climate from the climate of Italy, or the environs of Geneva, gives ſuch interruption to the culture, or ſo far leſſens the crop, as to render it not worthy the expence and trouble? It is certain that the climate of Italy, being much warmer than the climate of Scotland, the natural graſs, which is the greateſt enemy to the lucern, is more diſcouraged, and the growth of the plant rendered quicker, which gives more cuttings in the ſeaſon, and conſequently a greater crop. But then it may be oppoſed to this, that ſome of our land in Scotland is much richer than the land in the environs of Geneva that carried the large crop that has been mentioned. The land in the environs of Geneva, as ſhall be afterwards ſhown, is very poor, when compared to the land of our corn countries in Scotland. And where the land is better, it may be expected, that, if the proper culture is given, the cuttings, though fewer in number in the ſeaſon than in a warmer climate, will however be more plentiful, and the crop on the whole thereby rendered equal. It is true, that there is much greater difficulty in making hay here than in that climate, which may occaſion ſome inconveniency; but ſome method may poſſibly be fallen upon to remove this inconveniency, when there is more of this graſs than the farmer can diſpoſe of without making it into hay.

Though the plants of lucern raiſed in this country have ſtood the winter, yet ſome doubt may remain, whether our ſevere

vere froſts may not deſtroy it. To remove all doubts of his kind, let it be obſerved, that in the year 1755, the froſt the environs of Geneva was ſo ſevere, that M de Reaumer's thermometer was ſome days at different times 8, 9, 0, 11, 12, and 13 degrees below the freezing point, and n the third of February a thermometer in the open air ſtood 16 degrees below freezing. It is ſaid, that in the ſevere inter in this iſland, in the year 1739-40, Farenheit's thermometer, ſunk only to 12 degrees. The 16th degree elow freezing point in M. de Reaumer's thermometer, is equal to the third degree of Farenheit's, and herefore the cold in the environs of Geneva in the year 755, was nine degrees in Farenheit's thermometer, below hat it was in Britain, in the year 1739-40, and as none f the lucern ſuffered in the environs of Geneva in that evere froſt, we need not be afraid that it will ſuffer in any froſt that this country is liable to.

As there is then a very ſtrong probability, that this valuble plant may be cultivated with ſucceſs in Scotland, I ſhall roceed to repreſent the culture given it by thoſe perſons who aſs ſuch encomiums upon it, and ſhall begin with the method f cultivating it among the Romans as given by Columella.

To prepare the land for the ſeed, this author requires hat it be plowed in the beginning of October, a ſecond time n the firſt of February with great care, all the ſtones carried off, and the clods broken. He requires that it be plowed third time in the month of March, and well harrowed; nd when thus prepared, that it be made into beds of ten feet road, and fifty feet long, old dung thrown upon it, and hen ſown in the end of April in the proportion of a Cyathus † of ſeed to fifty ſquare feet. He directs further, that he earth be drawn over it with wooden rakes, immediately after it is ſown, declaring that the heat of the ſun,

† A cyathus is about $\frac{1}{12}$ of an Engliſh pint. The ſeeds are extremely ſmall, being about the ſize of Poppy-ſeeds, or rather ſmaller.

and touching it with any iron tool, is deſtructive. He requires that it be carefully weeded from time to time, that it be watered very often after it is cut; and that the firſt crop be not cut till it has put forth ſome of its ſeeds.

Mr Tull, with a deſign to ſhow the abſurdity of all the methods practiſed for cultivating this graſs, attemps to turn this practice of the Romans into ridicule. It would have been much better, if he had conſidered the matter with more attention, and not have put his own conjectures in the place of their practices. He cannot account for their employing ſo much time and labour about it, except it was to find employment for their ſlaves. But he would not have expreſſed himſelf in this manner, had he conſidered, that when this labour was given to the *medica*, as ſhall be afterwards ſhown, a labouring ſlave coſt about L. 50, or L. 60; that theſe ſlaves were cloathed and fed at almoſt as great expence, as the labouring ſervants in England, and that the intereſt of money was then ſix *per cent*, paid monthly. He was very ſolicitous in promoting a darling ſcheme, and this made him likewiſe over-look what Columella ſays, that a Jugerum of this graſs would fully maintain three horſes for the whole year, would laſt ten years, and the land be improved by it. The mentioning the number of cattle that any crop is ſufficient to maintain, is the proper way of aſcertaining its value; for by this we can always judge of its value, whatever may be the difference of the value of money. In this proportion a Scots acre of this graſs may be juſtly valued at preſent at L. 36, which is allowing, no more than 4*d* pence a day for each horſe; and if 6*d* is allowed, the value of the Engliſh acre will be as great, as the acre of aſparagus, or cabbage plants, which Mr Tull places in oppoſition to it. Is there any farmer that would not think the higheſt culture he could give, well beſtowed upon an acre, the produce of which is ſo valuable?

Mr

Mr Tull very juſtly condemns the Romans for their ſuperſtition, in not allowing an iron tool to touch their *medica*; as tools of iron might have been contrived, that would have greatly aſſiſted them in weeding it. But though their ſuperſtition in this and many other things deſerves to be condemned, yet I am far from being certain that the great men among them deſerve to be condemned for their complying with it. When this is ſeriouſly conſidered, it will appear perhaps an inſtance of their wiſdom rather than their folly. The adhering to theſe ſuperſtitions in agriculture was more neceſſary than in any other thing. There were very few tenants among them that rented farms from the proprietors, as in Britain: The farms were generally in the hands of the proprietors themſelves. Theſe gentlemen for the moſt part reſided at Rome, and managed their farms by ſlaves under the direction of a bailliff, *villicus*, or a grieve, as we call ſuch a perſon in Scotland. This Bailliff was commonly choſen from among the ſlaves; ſuch perſons, we may well ſuppoſe, were very ſuperſtitious, and when the whole management of agriculture was in their hands, it became neceſſary, in ſome degree, to humour their ſuperſtitions. When Virgil ſays, 'The moon too 'hath allotted days auſpicious for works, ſome in one 'order, and ſome in another. Shun the fifth.' No man of common ſenſe imagines, that Virgil himſelf was ſo ſuperſtitious, as to believe, that any piece of work would ſucceed worſe on the fifth day of the moon than on the fourth, or that it was better to take a journey on the ninth day, than on the tenth. But theſe being the received opinions of the common people, he humours them therein, that he may receive the more credit in matters of importance.

It is probable, that Columella might likewiſe humour the vulgar ſuperſtition in this and other things. He mentions the kind of weather that the riſing and ſetting of the different conſtellations forebod; not that he believed that this

this weather would actually happen, but in conformity to the vulgar opinion. We find, that he wrote ſome books againſt the aſtrologers upon this very ſubject, and he ſpeaks of the Chaldeans as impudent in affirming, as a thing certainly to be depended upon, that the changes of the air anſwer to certain ſtated days.

The covering the lucerne ſeed by the plough, as was the common way in their corn and pulſe, or perhaps even with their ordinary harrows with iron teeth, was found deſtructive: Hence the received opinion that iron was hurtful to it. And although Columella might impute this to the true cauſe, the burying the ſeeds too deep, yet he might adhere to the ſuperſtition as the moſt proper way to prevent this misfortune, which might frequently have happened, if the ſlaves had been allowed to make uſe of their iron tools, and which might thereby have been the occaſion of diſcouraging the culture of ſo uſeful a plant.

That the manner of cultivating this plant, lately introduced, is preferable to the manner in which it was cultivated by the Romans, I ſhall very chearfully allow; but if, by the culture which they gave, ſuch crops were raiſed as we have mentioned, they had no reaſon to change their method, and we have no reaſon to repreſent it as ridiculous or abſurd. But this method cannot be ſo eaſily followed, nor indeed would it be ſo ſucceſsful in this country as in Italy. The land in Italy is generally light, and the heats are ſo great as often to burn up the graſs: this made it eaſy for them to keep the lucerne free from weeds, at leaſt much eaſier than in this country, where our beſt land becomes hard in a ſhort time, and where the common graſs makes ſuch quick progreſs. It is this that has prevented in a great meaſure the ſucceſs of any trials that have been made in Scotland. In a few years the ſurface becomes ſo hard, and the turf ſo ſtrong, that there is no poſſibility of getting the better of it, ſo that at laſt it deſtroys the lucern; and this

this too, it is probable, long before the plant arrives at their greateſt perfection.

This ſhows, that we cannot hope to cultivate this graſs with ſucceſs, unleſs we fall upon ſome way to deſtroy the natural graſs, and prevent the ſurface from becoming hard and impenetrable: And in no way as yet found out, can this be done effectually but by horſe-hoeing. This is what was propoſed by Mr Tull, and has been practiſed with the greateſt ſucceſs by M. de Chateau vieux in the environs of Geneva, a crop that ſucceeds at Geneva, ariſing from a plant that is in the ground all winter, may be expected to ſucceed likewiſe in Scotland. It may be of uſe therefore, to repreſent in what manner this gentleman cultivates this uſeful and valuable plant, according to the accounts which he gives of it himſelf, in his letters to M. du Hamel.

This gentleman mentions nothing in particular, about the method of preparing the ground; only when giving directions about the tranſplanting the lucern, he ſays, that as the lucern is to remain ſeveral years on the ſame ground, no pains ſhould be ſpared in preparing the earth. The land on which he tried ſome of his experiments, had not been dunged for ſome years. However, the land on which any experiments are made in Scotland ſhould be prepared as well as poſſible. The crop encreaſed in a very ſmall proportion of its value, will do more than over-ballance all the expence of preparation.

He tried the ſowing the lucern both in rows, in the beds where it was intended it ſhould ſtand; and the ſowing it in a nurſery, and afterwards tranſplanting it into the beds prepared for it. He prefers the tranſplanting, and gives this reaſon, that the lucern when tranſplanted, having a part of its perpendicular root cut off, inſtead of puſhing perpendicularly downwards one principal root, as it does when ſown, puſhes out numbers of large lateral roots, which, being broke in the culture given it, branch out alſo into

others

others. This reaſon is ſufficient to determine us to this practice; for though the root that nature has given this plant, is the moſt proper to enable it to contend with the other plants around it in its natural ſtate; yet by dividing this root into many, and giving theſe a direction nearer the ſurface, it is rendered the more eaſily cultivated, and made to flouriſh in ſoils, in which, if left in its natural ſtate, it could not live. It will not be amiſs however, that we add ſome other reaſons in favour of tranſplanting.

The land on which the lucern is to be planted, may be prepared during the ſummer, by which means the field, when planted with lucern in the autumn, muſt be in a much better ſituation, than if it had been ſown in the ſpring, even ſuppoſing, that the land had been fallowed in the former ſeaſon; and when it is ſown in the ſpring in beds for horſe-hoeing, the firſt year's crop is very ſmall, and can ſcarcely be ſuppoſed to exceed it in value the expence of culture; ſo that by tranſplanting, one year is ſaved.

There is another thing that may be mentioned: by tranſplanting the lucern, the rows can be more regularly placed, and the intended diſtances more exactly kept. This is of greater importance, than perhaps appears at firſt ſight. Thereby the hoeing can be performed more perfectly, and with leſs labour, and inſtruments may be made uſe of, like thoſe contrived by M. de Chateau vieux, which with great exactneſs, may perform the whole work neceſſary in the alleys or intervals at once going; and alternately turn the earth from the rows, or towards them, as is neceſſary. To theſe I ſhall only add, that thereby the plants are ſet at the exact diſtances intended, and there is thereby a great ſaving of ſeed, which, though a ſmall article, ought not to be overlooked.

The advantages of tranſplanting are confirmed by the experience of M. de Chateau vieux; for he ſays, that the lucern, which he drilled in beds, where it remained without

out being tranſplanted, was not by far ſo ſtrong and flouriſhing, as that which he had tranſplanted. He obſerves in favours of tranſplanting, that when ſeed is ſown in the place where it is to ſtand, it requires to be thinned, which operation takes up more time than tranſplanting.

This gentleman likewiſe tried the lucern in ſingle beds, three feet wide with ſingle rows, in beds three feet nine inches wide with double rows, and in beds four feet three inches wide, with triple rows *. The plants in the ſingle rows, were ſix inches aſunder, and thoſe in the double and triple rows were about eight or nine inches In a courſe of three years, he found, that a ſingle row produced more than a triple row of the ſame length.

Forty toiſes of a ſingle row, produced of dry hay,	
in the year 1754	205 *lib.*
in the year 1755	297
in the year 1756	201
in all	783
Forty toiſes of a triple row, produced,	
in the year 1754	169 *lib.*
in the year 1755	180
in the year 1756	226
in all	575
The ſingle row produced in three years	703
The triple row produced in the ſame time.	575
The ſingle row produced more than the triple	128

* Suppoſing an Engliſh foot to be 1000. The French foot is 1068 of the ſame parts. So that three French feet are equal to three feet two inches and one half Engliſh. Three feet nine inches French, to four feet Engliſh; and four feet three inches French, to four feet ſix inches Engliſh.

It muſt be obſerved, that the ſingle rows were only three feet diſtant from each other, but that from the middle of one triple row, to the middle of another, was four feet three inches; ſo that there were 68 ſingle rows in 40 toiſes, in the ſame ſpace with 48 triple rows.

68 Single rows of 40 toiſes, at the above rate of 703 *libs* in 3 years produced, 47804

48 Triple rows of 40 toiſes, at the above rate of 575 *libs* in 3 years produced, 27600

So that the field in ſingle rows produced, almoſt the double of the field in triple rows; a difference ſo conſiderable, could not be produced by any accident. M. de Chateau vieux however does not pretend, from this experiment, to determine that the planting in ſingle rows is the beſt way, as things may appear otherwiſe in other trials; though it is natural to ſuppoſe, that the crop in ſingle rows will exceed the crop in the double or triple rows, ſtill more in after years, than in the firſt three or four.

It has been already obſerved, that M. de Chateau vieux ſet the plants in the ſingle rows at ſix inches diſtance one from another; he is of opinion, that they ought never to be ſet nearer. From what he ſays, it is natural to think, that they would do much better at a greater diſtance. He obſerves, that after the firſt cutting, the ſtalk formed itſelf into a head upon the top of the roots juſt above the ground, and that this head extended itſelf every year. The firſt year this head was from two to three inches wide; on the ſecond it was generally about ſix inches over; and in the third year, almoſt one half of the plants had crowns of 10, or 12 inches diameter: and as they had not room to extend themſelves along the rows, had taken an oval form to the ſides on which they met with no interruption.

If the farmer then has reaſon to expect, that the plants of Lucern, which he ſets, will flouriſh in the ſame manner, it would be better to ſet them at a greater diſtance from one another

another than ſix inches. Tho' this ſhould leſſen the crop in the firſt two years; yet it is probable, that it would render it larger afterwards, as plants always thrive beſt, when they meet with leaſt interruption. Had the plants in the rows, mentioned by M. de Chateau vieux, been ſet at 8 or 10 inches diſtance, they would have covered the ſurface with their crowns as much in the third year, as they did when ſet only at ſix inches diſtance, and the plants themſelves being ſtronger, would have produced a larger crop.

This gentleman is of opinion, that the beds or ridges upon which the lucern is to be planted, ought to be raiſed in the middle, which can eaſily be done by the plough in forming them; that a ſmall trench, of two or three inches deep, ought to be drawn in the middle, and that in the bottom of this trench the plants ought to be ſet, covered with earth up to the neck. Theſe directions are certainly very proper: the raiſing the ridges makes a greater depth of mould, makes the ſoil looſe where the bottom of the root is placed, by which means the plant ſtrikes root the more eaſily, and is the better nouriſhed, by ſetting the plants in the bottom of the ſmall trench, they are preſerved from the drought, and the culture given afterwards, does not render ſo much of their tops bare, as it does when they are ſet higher.

He ſays, if the lucern is ſown in ſpring in a warm ſoil, it will be ready for being tranſplanted in autumn, that September is the proper ſeaſon for this, as the plants, if ſet then, will have time to ſtrike root before winter; that if the weather is too hot and dry in that month, they may be ſet in October, provided it does not freeze; and that if the warm and dry weather prevents the tranſplanting in September or October, then the work ſhould be delayed till the ſpring. In the environs of Geneva, I ſuppoſe, that the tranſition from heat to cold, is much quicker than in Scotland: ſo that it may ſometimes happen in that place,

from the quickneſs of this tranſition, that there is no proper ſeaſon for tranſplanting the lucern in autumn, but this can ſcarcely ever happen in this country, and therefore the autumn may be conſidered by us, as the proper ſeaſon for tranſplanting lucern: The delaying it till the ſpring is a real diſadvantage, and therefore ought never to be done but in a caſe of neceſſity; for the firſt crop after tranſplanting, according to M. de Chateau vieux, will be conſiderable if this is done in the autumn, but very ſmall if done in the ſpring.

Though ſeed ſown in the ſpring produces plants fit for being tranſplanted in the autumn, yet this gentleman obſerves, that plants two or three years old may be uſed. It is probable, that even much older plants than theſe will ſucceed. M. du Hamel ſays, that he took up the plants of a field of very old lucern, and ſet them in trenches. They were ſo old, that all his labourers ſaid they were wore out, and yet there was not one of them that failed. They yielded three cuttings the ſeaſon after, though the ſoil was not very proper for them.

M. de Chateau vieux directs, that the plants be taken out of the nurſery with great care, that the roots may not be damaged; that the roots be left about ſix or ſeven inches long; that the green tops be cut off, within about two inches of the crown; that they be put into water as ſoon as taken up, there to remain till planted; and that they be planted with a planting ſtick in the ſame manner as cabbages.

He does not give any particular direction as to the times of horſe-hoeing, only ſays in the general, that it is his opinion, that the alleys ſhould be ſtirred once in the month, during the whole time that the lucern is in a growing ſtate.

With reſpect to weeding, he ſays, that great care ſhould be taken not to ſuffer any weeds to grow amongſt the lucern, at leaſt for the two or three firſt years; and for this purpoſe,

purpoſe, that the rows ſhould be weeded by hand, as well as the edge of the alleys near the plants, where the horſe-hoeing cannot go.

The propoſing to hoe the plants once in the month, during the growing of the lucern may, perhaps, be thought very troubleſome and expenſive; but if the ſoil is once made free and open, this can be done very eaſily by the inſtruments which this gentleman has contrived. He has contrived one, by which the earth in the middle of the alley, is thrown on each ſide towards the rows; and another, by which the earth from the two rows, is thrown into the middle of the alley; ſo that at once going, the whole work neceſſary in the alley is performed; and in this way an acre may be hoed in leſs than three hours.

There is one difficulty which neither Meſſrs du Hamel nor de Chateau vieux take any notice of. Perhaps it is not a great difficulty either in the environs of Geneva nor in France where the ſummers are hot. What I mean is, the making of hay. Perhaps in theſe countries, in a day or two, the hay may be in a ſituation to be carried from the field, and put up in ricks. In this caſe there is very little difficulty. But it is otherwiſe in this country. Many days paſs after the hay is cut in our fields, before it is in a proper ſituation to be put in ricks; and what to do with it before that time it is not ſo eaſy to determine. Mr Tull was ſenſible of this difficulty, and therefore to make the hay of horſe-hoed St Foin, he propoſes that every ſecond alley ſhall be left unhoed, and that the hay ſhall be made upon the unhoed alleys. But this ſpace not being three feet wide, cannot allow the ſmalleſt kind of ricks to be put up upon it, and therefore the hay muſt ſtill be carried off while green. Beſides, on this plan the rows want their proper culture, and the culture to the unhoed alleys muſt be ſeverer when given. But this ſhould be no objection to the making trials to cultivate this graſs. There is ſtill a great demand for green forrage; no kind of graſs

can

can be ſuppoſed to anſwer ſo well for this as lucern, and before there are ſuch quantities of this graſs, as cannot be diſpoſed of in green forrage, ſome better method of making the hay may be found out, than has as yet been thought of. Perhaps it may be found worth while to have a machine made on purpoſe for carrying it from the field, and to have a piece of graſs ground ſet a part on purpoſe for making the hay. If a crop can be raiſed in Scotland, nearly of the value of thoſe mentioned by M. de Chateau vieux, it may afford a very great expence in making the hay; and ſuch a proſpect muſt naturally engage perſons to contrive the beſt methods for this purpoſe.

I have already obſerved, that M. de Chateau vieux has contrived inſtruments by which the whole work neceſſary in the alley is performed at once going. The one is in the form of a plough with two mould-boards, and a ſhare, with a fin on each ſide, or, as we call it in Scotland, a ſock with a double feather. This plough may be made either with or without a coulter, as the ſoil requires.

The other is formed, by placing two ſhort beams on each ſide of the long beam, fixed ſtrongly to it by croſs bars, each of theſe ſhort beams has a ſhare fixed to it, with a long neck, and an eye into which the beam goes, and the fins are placed in ſuch a manner as to ſerve for mould-boards, which turn the earth towards each other. Theſe ſhort beams are ſet at ſuch a diſtance from each other as to anſwer preciſely the width of the alleys.

If the ſoil is in its nature free and open, and if the field is well fallowed before the lucern is planted, it is probable that the whole work may be performed by inſtruments of this kind, and that thoſe inſtruments may be made in ſuch a manner as to go twice, or oftner, in one place, ſo as to ſtir the ſoil to a conſiderable depth where it will allow.

I am perſuaded, that good crops of this valuable plant can be raiſed in Scotland, in no other way than this that has

has been mentioned, and whoever is ſo happy as by trials to convince the farmers in his neighbourhood of the poſſibility of raiſing ſo valuable a crop, will merit the thanks of all the lovers of agriculture.

ARTICLE XLIII.

An ESSAY *on the* MANAGEMENT *of* HOGS; *including Experiments on Rearing and Fattening them: By* ARTHUR YOUNG Eſq;

[*Continued from* p. 316.]

EXPERIMENT. V.

AT the time of the preceeding experiment, eight hogs, of equal ſize, were divided into two lots, and confined to two ſtyes. Four were fed fourteen days on clover mown, and the other four on lucern mown; they were given at the ſame time, and in the ſame ſtyes. At the end of that time they were viewed attentively: both were bad, but the clover ones much the worſt, one near dying.

EXPERIMENT. VI.

The month of December, 1766, twenty pigs, that had been weaned a month, were draughted into four parcels, and kept that month, ſeparately, in the following manner.

No 1. Boiled carrots.
2. Boiled potatoes.
3. Boiled turnips.
4. Boiled cabbages.

At the end of the month they were turned out and viewed attentively. The reſult was,

No 1. The beſt,—boiled carrots.
2. Next,—boiled potatoes.
3. and 4. Equal,—all nearly dead.

Carrots

Carrots continue in every trial ſuperior to all common vegetable food. I am not at all ſurpriſed at the ill ſucceſs of turnips and cabbages.

EXPERIMENT VII.

In June, 1767, I draughted from my hogs twenty that were of a perfect equality in ſize and appearance; they were even half grown; marked them into four lots, and turned

No 1. Into my clover field.
2. ——— lucern ditto.
3. ——— ſainfoine ditto.
4. ——— burnet ditto.

In another month they were drove up and viewed; the reſult was,

No 2. The fineſt,—lucern.
1. Next,—clover.
3. Next,—ſainfoine.
4. Very indifferent,—burnet.

The reſult of this experiment I think deciſive in favour of lucern, and likewiſe in the proportionable merit of the other articles. But this muſt be farther enquired into in future experiments.

EXPERIMENT VIII.

In January 1768, three ſows, very much alike in all reſpects, pigged, one ſeven pigs, another eight, the third ſix, in about a week. I ordered them to be fed diſtinctly.

No 1. With raw carrots.
2. With ſkim milk.
3. Common waſh of the better ſort.

In a fortnight they were viewed. The pigs of

No 2.

No 2. Were the fatteſt,——ſkim milk.
1. Next,———raw carrots.
3. Worſt,———Common waſh.

This experiment is not deciſive, for reaſons too tedious to mention; but yet the reſult ſhould urge the attentive to vary theſe experiments, that certainty may at laſt be known.

OBSERVATIONS.

The general reſult of theſe trials is drawn into one view in a very few words.

Milk mixt with pollard appears to be, of all food, the moſt proper for rearing of pigs,

Milk alone is good.

Boiled carrots, excellent, and fully proved to be ſufficient for any farmer to depend on, who does not keep a good dairy.

Potatoes are alſo a very good food.

Turnips, cabbages, and malt-duſt, very bad.

Of green food, that which is growing, is clearly the beſt; mown and given in ſtyes, it is pernicious.

In the field, lucern is ſuperior to all the reſt. Clover comes next, then ſainfoin: all theſe three are good. Burnet laſt, and bad.

Exeriments on fattening of Hogs

EXPERIMENT I.

In February, 1765, I weighed a buſhel of white boiling peaſe, the weight was ſeventy-one pounds, the price 4*s*. A buſhel of pollard, twenty-five pounds one quarter, price 8*d*. A buſhel of bran, fifteen pounds one quarter, price 6*d*. Quere, which is the cheapeſt food for hogs, ſeventy-one pounds at 4*s*. or twenty-five pounds at 8*d*? The peaſe are ſix times the price of the pollard, and only three times the weight.

THE

THE TRIAL.

I drew four pigs from my herd, of equal appearance, divided them into two lots, and weighed them alive.

	S.	P.
No. 1. weighed	6	5
2. ———	6	7
3. ———	6	3
4. ———	6	8

Lot 1. contained the hogs No. 1 and 2, weight 12 S. 12 P.
Lot 2. contained the hogs No. 3 and 4, weight 12 S. 11 P.
The equality of theſe weights is remarkable; but, in an hundred hogs, I do not think my bailiff would miſtake two pounds in half a dozen ſtone.

Lot 1. was confined to a ſtye, and had eight buſhels of peaſe given them, weight 565 pounds, price 1 *l.* 12 *s.*

Lot 2. was confined to a ſtye, and had forty-eight buſhels of pollard given them, weight 1212 pounds, price 1 *l.* 12 *s.* Both the pollard and peaſe were given dry with water in a trough. Each lot was weighed, as ſoon as the food was done. The reſult was,

	S.	P.	S.	P.
No. 1. Weighed	19	2		
2. ———	21	5		
Superiority of No 2 is			2	3
Add 1 pound, the firſt inequality .			0	1
Total ſuperiority			2	4

A ſingle experiment muſt not be ſuppoſed to decide this matter, but future ones may determine it.

EXPERIMENT II

In January 1766, I drew from the herd ten hogs, as equal in ſize as poſſible, and weighed them alive in five lots.

No 1.

		P.	S.
No 1	Weighed	13	4
2	——	12	6
3	——	13	0
4	——	12	11
5	——	13	1

A nearer equality than this, in matters that can neither e added to nor diminiſhed, can ſcarcely be expected.

No. 1. was fatted with white peaſe, that weighed ſixty-x pounds per buſhel; the price 30 *s.* per quarter.

No. 2. with pollard, that weighed twenty-two pounds per uſhel; the price 9 *d.* per buſhel.

No. 3. with buck-wheat, that weighed forty-ſeven pounds er buſhel; the price 2 *s.* 3 *d.* per buſhel

No. 4. with boiled potatoes, that weighed fifty-four ounds per buſhel; the price 2 *s.* per buſhel.

No. 5. with boiled carrots, that weighed raw fifty five ounds per buſhel; the price 1 *s.* 1 *d.* per buſhel.

I thought it beſt to fix on a given ſum, as proper to fat ach hog. The people I conſulted were of opinion, that ight buſhels of white peaſe were neceſſary to fat one ſuch og well. This I accordingly fixed on as my criterion. The account of the expence theretore ſtood thus:

				l.	*s.*	*d.*
No. 1.	Peaſe, 16 buſhels	-	-	3	0	0
2.	Pollard, 80 buſhels	-	-	3	0	0
3.	Buck-wheat, 27 buſhels	-	-	3	0	9
4.	Potatoes, 28 buſhels, 2 *l.* 16 *s.*					
	Labour and coals,	-	4			
				3	0	0
5.	Carrots, 49 buſhels,	2 13 2				
	Labour and coals,	5 10				
				3	0	0

Each lot was weighed as ſoon as the food was done. The reſult was as follows:

	S.	P.
No. 1. weighed	27	6
2. ———	27	9
3. ———	29	13
4. ———	25	7
5. ———	31	0

It is evident from this experiment, that carrots boiled a ſuperior to any other food. I did not expect that potato would be ſo much inferior; but I have found from dive other trials ſince, that it is requiſite to mix the meal ſome kind of corn with them. Pollard in this trial, as the laſt, is ſuperior to peaſe.

In January, &c. 1766, having a large number of ho fatting, I purchaſed various kinds of food for them, whi were given them, ſome alone, and others mixt together, diſcover which fatted them in the cheapeſt and quick manner; this being, in the opinion of ſome, a fairer w of diſcovering the nature of every kind of food, than t other method.

EXPERIMENT. III.

Seventy-ſix hogs, from ſeven to fourteen ſtone lean, e in ſeven days, after nine days fatting,

	l.	*s.*
17 quarters 5 buſhels pollard - - - - -	5	17
1 buſhel, beans - - - - - - -	0	4
7 quarters 2 buſhels, peaſe, ground - - -	10	17
3 quarters 5 buſhels, or 2 *l.* 7 *s.* per diem.		
	16	19

EXPERIMENT IV.

Eighty-eight hogs eat in twelve hours,

Q.	B.		*l.*	*s.*	*d.*
1	6	buck wheat - - -	1	11	6
0	2	peaſe-meal - - - -	0	8	0
1	3	bran - - - - - -	0	5	6
3	3	- - - - - - -	2	5	0

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EXPERIMENT V.

	l.	*s.*	*d.*
The ſame hogs eat next day, two qrs. of white peaſe, - - - - - -	3	0	0

EXPERIMENT VI.

The next day, - - - - -	*l.*	*s.*	*d.*
1 quarter of peaſe - - - -	1	10	0
2 buſhels of buck-wheat - - -	0	4	6
	1	14	6

From this day's quantity, I ſhould think they either did not like the buck-wheat ſo well as the peaſe, or the buck-wheat is a much more filling food; but two quarters of peaſe were the greateſt quantity of that food they eat in one day, during the whole fatting.

EXPERIMENT VII.

The next day they eat 2 quarters of buck wheat. - - -	*l.*	*s.*	*d.*
	1	16	0

This day's fatting is in ſome meaſure a proof that buck-wheat is an agreeable food to them, ſince they eat as large a quantity as of peaſe; but they ought to have eat as much more of it, if the proportion lies in the weight and price.

EXPERIMENT VIII.

The next day they eat 2 quarters and a half of peaſe-meal buck-wheat flour, and pollard mixed, the proportion 13 *s.* 4 *d.* per quarter.	*l.*	*s.*	*d.*
	1	13	4

EXPERIMENT IX.

The next ſeven days they eat 22 quarters and a half of the above mixture, at 13 *s.* 4 *d.* per quarter.	*l.*	*s*	*d.*
	15	0	0
Carry over	15	0	0
Brought			

	l.	s.	d.
Brought over	15	0	0
1 Quarter and a half of buck wheat - -	0	18	0
7 Buſhels of peaſe - - -	1	7	0
3 quarters and a half are 2 l. 9 s. per day	17	5	0

The quantity the hogs eat of this mixture, and their thriving extremely well with it, is a ſtrong proof that the different qualities of the ſeveral ſorts being finely incorporated in the mixture of their flour, contributed much to the forwarding of their fatting; and the proportions ſhew that they eat more than when fed with one only.

EXPERIMENT X.

The next day they eat	l.	s.	d.
1 Quarter of buck-wheat - - -	0	18	0
7 Buſhels of Peaſe - - - -	1	7	0
	2	5	0

EXPERIMENT. XI.

The next day they eat	l.	s.	d.
1 Quarter 4 buſhels of peaſe - -	2	5	0

EXPERIMENT. XII.

The next day they eat,	l.	s	d.
1 Quarter 4 buſhels of peaſe - - -	2	5	0
1 Buſhel of buck-wheat - - -	0	2	3
	2	7	3

EXPERIMENT. XIII.

The next eighteen days they eat,	l.	s.	d.
24 Quarters 1 buſhel of peaſe-meal - -	39	0	0
6 Quarters of barley-meal . . .	7	4	0
1 Quarter 1 buſhel buck wheat flour - -	1	2	6
7 Quarters 4 buſhels of polard - -	2	5	0
1 Quarter of bran - - - -	0	5	4
2 Quarters one buſhel are 2 l. 15 s. per day.	49	16	10

The

The difference of two quarters and three and a half, in experiment IX, is remarkable, and ſeems to prove, that the hogs eat by weight and value, and not by meaſure: the quantities are very different, but the prices do not vary equally. No. 10, 11, 12, are whole grain, at forty-five pounds per day. This is all ground, and they eat ten pounds a day more; from which I conclude, that the meal fattens much the beſt.

EXPERIMENT XIV.

	l.	*s.*	*d.*
The next day they eat, 1 quarter 4 buſhels of peaſe-meal	2	6	5

EXPERIMENT XV.

	l.	*s.*	*d.*
The next day they eat, 1 quarter 5 buſhels of peaſe-meal	2	10	4

EXPERIMENT XVI.

	l.	*s.*	*d.*
The next day they eat, 1 quarter 7 buſhels of peaſe-meal	2	18	0

EXPERIMENT XVII.

	l.	*s.*	*d.*
The next three days they eat, 5 quarters 2 buſhels of peaſe-meal	8	2	9

1 quarter 4 buſhels, is 2 *l.* 14 *s.* 3 *d*, per day.

EXPERIMENT XVIII.

	l.	*s.*	*d.*
The next day they eat, 1 quarter 4 buſhels of peaſe-meal	2	8	0

From all theſe trials, it appears that the meal is better than the whole grain.

EXPERIMENT XIX.

In January 1768, I confined three hogs to different ſtyes, and fed them thus,

No 1. With peaſe,
2. ——Beans
3. ——Barley,

to ſee which pork was beſt and firmeſt. They were in every reſpect as equal as poſſible.

No 3. The whiteſt fat, and firm, and well-taſted meat.
1. The next in whiteneſs, and equally firm.
2. Very dark and ill-taſted, but firm.

OBSERVATIONS.

It appears from theſe experiments, that pollard alone (at the preceeding prices) is a cheaper food than peaſe alone.

That boiled carrots is much the moſt profitable food that has been tried.

That buck-wheat is a more profitable food than peaſe.

That ſeveral kinds of food mixed, are better than being given alone.

That the meal of any one, or of various kinds of grain, is better and more profitable than the whole grain, mixed or alone.

That peaſe and barley are a much ſweeter food than beans.

The above experiments are humbly ſubmitted to the Society, not as perfect, but rather as a mark of the Author's wiſhes to be uſeful. He ſhall not be diſpleaſed to find, that others have been more accurate and attentive than himſelf.

ARTHUR YOUNG.

ARTICLE XLIV.

Of Houſing great Cattle.

[From MUSÆUM RUSTICUM, VOL. V.]

AMONG the advantages attending the late changes in management of farms in this part of the world, I muſt rank thoſe which ariſe from houſing of great cattle, by which name I underſtand cows and oxen.

The practice has long been in vogue with thoſe who had only *one* or a *few* cows; but I remember when thoſe who had many never thought of ſuch a practice with regard to their herds, though they occaſionally uſed it with reſpect to particulars.

However, the obvious advantages reſulting from the method, with regard to a *few* cattle, has induced our farmers to adopt it with reſpect to *more*; yet it is not ſo generally followed as it ought, and by many, otherwiſe ſenſible men, is even held *problematical*.

I ſhall therefore, in this letter enumerate all the objections which have been, or can, I think, be made to the practice, give anſwers to them, and then diſplay its advantages.

The objections to this practice are:

1. "It renders catttle more tender."
2. "It conſumes much more fodder."
3. "It requires much more attendance."
4. "It is very expenſive in building of houſes, leading "home of hay, and leading out of manure."
5. "It is waſteful of manure."
6. "It is not ſo healthy as lying out, which gives ex- "erciſe."

As to the firſt, it is acknowledged, that a cow uſed to the houſe will ſuffer much more than one not uſed to it, if

if left out of doors. But this method ſuppoſes them to be houſed from the firſt colds and rains at the beginning of winter, to the true ſpring weather, when paſtures are broke at *May-Day*; ſo that this objection amounts only to an aſſertion, that animals which are uſed to proper care, will, if neglected, ſuffer more than ſuch as are uſed to be neglected; an aſſertion, which, if it proves any thing, proves that we ſhould neglect all our domeſtic animals. But to ſhew the degree of tenderneſs to which great cattle will be ſubject by the houſing I recommend, I muſt obſerve, that all the houſing I would wiſh them to have ſhould be a good cover over head, and a defence from the *northern* and *eaſterly* winds, and perhaps the *weſterly* ones in this country, as they blow cold in ſpring, when the cattle loſe their hair: but I would chuſe to have my cow-houſes open to the ſouth.

Now, what degree of true hardineſs cattle can derive from lying with their ſides on wet ground all night, and having their ridges (well known to be tender, and the ſources of many maladies) expoſed to all the rain, *&c.* of a whole winter, and their feet and legs benumbed in wet grounds continually, I leave any man of ſenſe to determine.

The generally-wretched condition, in ſpring, of cattle which have lain out, compared with the good plight of thoſe which were in equal circumſtances at the beginning of winter, but have been houſed and fed with the ſame hay, will ſhew how ridiculous it is to object tenderneſs to the practice of houſing.

White cattle are univerſally allowed, and, I think, with reaſon, to be more tender than the *red*, *brown*, or *black*. Now, the breed of cattle in this part of the world is notoriouſly run into the *white* and *whitiſh*; ſo that the argument for houſing is much ſtronger with us, while the breed continues

continues in this ſtrain, unleſs we will kill our cattle for fear of tendering them.

As to the ſecond objection, it is acknowledged, that houſing conſumes more fodder; but then we muſt conſider how far it is a juſt objection to the practice. Now, it is obvious, that if cattle are to be kept not only *alive*, but *well*, and in condition to be uſeful in ſpring and ſummer, they muſt have their bellies well filled. The only queſtion then is at preſent, with what their bellies will be moſt advantageoſly filled, whether with *hay alone*, or with *hay and winter graſs?*

Now, any perſon, who knows any thing of the matter, muſt acknowledge, that winter-graſs is one of the beſt manures that can be beſtowed on meadow-ground, as it keeps the roots of the graſs much warmer than any other manure which lyes not ſo compact can do. But winter-graſs having loſt its genuine juices, and being in a ſtate of corruption, muſt be, on many obvious accounts, the worſt food which can be given to animals that are to yield milk, or to work in ſummer, therefore the worſt food for cows and oxen: ſo that he who eats off his winter-graſs, eats his crop of hay for the ſucceeding year, to fill the bellies of his cattle with bad humours; and if this be a prudent ſaving of fodder, then is houſing of cattle bad huſbandry.

I muſt alſo here obſerve, that the quantity of hay trode under foot, ſpoiled by rain and the dung of the cattle, and ſcattered abroad by winds, is not inconſiderable; ſo that if this be added to what lying-out cattle *really eat*, we ſhall find the difference betwixt the quantities conſumed by them and an equal number of houſed cattle, not nearly ſo conſiderable as may at firſt be thought.

The third objection ſeems more ſpecious, but will be found equally inconcluſive.

The taking away of the dung from the cattle, the driving of them to water and back again, are circumſtances

of attendance avoided, to be ſure, by letting cattle lye out; bu
they are not really very conſiderable, and abundantly recom
penced by other circumſtances of attendance which are ſa
v d. The man who houſes his cattle properly, will con
trive to have a pond near his cow-houſe. To this th
cattle will ſoon go of themſelves, and as regularly return
In the mean time the dung is moved, and the ſtalls (or bou
ſes, as we here call them) are filled with hay from th
neighbouring ſtack, by almoſt any boy or woman on occa
ſion. And ſo much attendance is ſaved by this practice o
houſing, both to the milk-maid, who has only to ſtep int
an adjoining dry houſe inſtead of a wet and diſtant cloſe, and
to the man ſervant, who has not his fodder to bear to cattl
in diſtant and wet grounds, and to diſperſe over thei
grounds, that it is well known to be one of the firſt enquiries
which both men and women ſervants make at the time o
hiring, " Whether the maſter who treats with them hou-
" ſes his cattle?" and he who does houſe them, may al
ways hire ſervants conſiderably cheaper than others who
do not can; as ſervants, who know the ſlavery of attend
ance on cattle lying out, will hardly hire at any rate to ſuch
as do not houſe their cattle, if they can hire to ſuch as do.

The maſters alſo find ſo much time ſaved by the leſs at
tendance on cattle houſed than thoſe which lye out, tha
they can even diſpenſe with fewer ſervants, both men and
women, in winter, than they could otherwiſe; ſo that the
ſaving of attendance by houſing of cattle, may juſtly be
conſidered as a ballance to the leading home of hay, and
leading out of manure.

Much expence of molding is alſo ſaved; and cow dung
being only in a ſtate proper for breaking, when neither
very wet nor *very dry*, the ſeaſon is often not favourable
for this work; and by this means what ſhould *manure* the
ground, goes to the fire; as in ſome counties the *ſlovenly*
fooliſh farmers deſignedly convert their cow-dung to this
uſe.

uſe. *Fooliſh* I may juſtly call them, if they can have any other fuel; *unhappy*, if they cannot.

The fourth objection is already in a manner anticipated and anſwered: for the buildings neceſſary to anſwer the purpoſes of houſing of cattle are no ways expenſive. Few farmers want a ſouth wall of ſome kind; againſt this let them erect a kind of helm of any coarſe wood, and wind the eaſtern and weſtern ends with thorns or furze if ſtones be ſcarce. Let them cover it with a few waggon loads of furze, broom, or heath, and if they thatch it ſlightly, it will laſt many years. The ſtalls, as they are kept dry, may be made of any offal wood, and the channel for a conveyance of the urine of the cattle is ſoon laid with coarſe ſtones. The leading home of hay may be made not very expenſive, by putting it in the field into load pikes, and ſtationing theſe ſo that the waggon ſhall make as few tracts as poſſible, the picks themſelves being made by a ſingle horſe's leading in the cocks with a ſledge or rather a rope.

At vacant ſeaſons for leading out the manure may be taken, this, though the chief, will be no great expence; and probably the attendance ſaved in winter and ſpring will be a ballance both to the expence of leading home hay in autumn, and leading out manure at a proper ſeaſon; eſpecially if the farmer judiciouſly contrives to have his meadow ground as near home as poſſible; and if he cannot have this, his winter attendance on lying-out cattle will be proportionally greater.

But if it ſhould be thought, that the ſaving of attendance in winter and ſpring is not an equivalent to the expences incurred by houſing of cattle and enumerated in this objection, yet this ſaving is conſiderable; and the advantages which I ſhall enumerate in the cloſe of this letter muſt be thought to be a great over ballance to any expence incurred by it, in the opinion of judicious men, eſpecially as a cow-houſe once built ſtands many years, and a draught has little

other

other work betwixt the autumnal ſeaſon and depth of winter, than to lead out manure, or, in the hay harveſt, than to lead the hay home.

I would have manure led out as ſoon as the firſt fogg or aftermath is eaten.

The fifth objection is grounded on a ſuppoſition, that the manure which is made by houſed cattle, when turned out in the day time, is loſt. But to this I anſwer, that the cattle are generally either turned into a yard or field in the day time: in the former caſe, the manure is eaſily ſhovelled up at a proper ſeaſon and carried out in the ſame way as the reſt; or in the latter caſe, it is ſpread on the ground, where it is made, ſo that there is little or no loſs of it.

Indeed people who agree in the point of houſing of cattle, differ in their ſentiments about managing of them in the day time; ſome keeping them continually in the houſe, or at leaſt yard, except the time of watering; others turning them out to graze by day; and the different circumſtances of people will make theſe oppoſite methods of management equally prudent.

For inſtance, where manure cannot eaſily be gotten, it will be adviſeable for people to take particular care of all that is made by their great cattle, as they have nothing elſe for their tillage. On the contrary, where people have plenty of other manures, and are at a diſtance from water, it is adviſeable to let their cattle wander on to muirs, where they may brouſe on the heath or furze, or ſuch like.

This is the conſtant cuſtom of the inhabitans of all the muirs above this place. They have plenty of lime for their tillage by the coals and lime ſtone near them, and of manure for their meadows by their turf aſhes: They have little incloſed ground, and this they preſerve as free as they can in winter; otherwiſe the coldneſs of their ſituation and lightneſs of ſoil, if they eat it bare, would deprive them of all hopes of a crop in the ſucceeding ſummer; their cow-

paſtuers

paſtures with all advantages, being ſcarce able to keep their ſmall cows in June.

Theſe people in winter turn their cows into their town ſtreet, whence they all march to ſome common pond adjoining to their commons, where they brouſe all the day, and return of themſelves at night to their ſtalls. By theſe means, with very ſlender crops of hay, they keep their cattle in very tollerable plight.

As to the laſt objection, lying out expoſes cattle to ſuch colds as produce many diſtempers, and is utterly inconſiſtent with their health, except in very favourable winters. But if the farmer really thinks that his cattle want exerciſe, he may turn them out in the beſt part of the day into his drieſt grounds; yet I am myſelf convinced, that till ſpring approaches, cattle get much more harm than good by ſtaying out. Standing out is not exerciſe, and cattle turned out in unfavourable weather ſtand rather than walk; and cows which lye out, ſtand too much, unleſs hunger oblige them to walk in ſearch of food.

I will now very briefly diſplay the advantages which reſult from the houſing of great cattle.

In the firſt place, by this means the meadows are winter-freed, and the beſt aſſurance of a good crop of hay is laid.

In the next place, the injury done to the ſoil by the treading* of great cattle is avoided.

In the third place, the carcaſes of the cattle are kept in much better plight.

In the fourth place, the cows give much more and better milk, and longer.

In

* I once ſaw a ſmall cloſe of very rich ſoil in this neighbourhood ſo trodden by very large fat oxen, in a wet winter, that though half their hay was buried under their feet, and the next ſummer a moderate one, there was abſolutely no crop. The oxen weighed about 100 ſtone each.

In the fifth place, the cows avoid many diſaſters in calving, and are then attended with great eaſe.

In the ſixth place, the calves are found to be ſtronger and livelier.

In the laſt place, the manure is laid on ſuch grounds and parts of grounds, as moſt want it, and in any proportion, and with any mixture the owner pleaſes: whereas it is notorious, to the ſorrow of every prudent farmer, that cattle lying out, manure chiefly the ground which lye under hedges, and wants it not, and by its irremediable coarſeneſs never pays for that manure.

I muſt add, that there is no compariſon between keeping of oxen in a fold garth, and keeping of them tied up like milch-cows.

For, in the firſt place, much miſchief is often done by the oxen to each other, when promiſcuouſly turned into a fold-yard, and eſpecially to the younger and weaker.

Secondly, They all lye expoſed to the wet from heaven, and conſequently to the ſame evils in ſome degree, as when they lye out.

Thirdly, As the fold-garth is the ſink of all their urine, they often lye wet.

Laſtly, The waſte of ſtraw which is made in a fold-garth is incredible.

Were ſtraw of no other value than to make manure of, the ſteeping of it thus in the urine of the oxen would be a judicious method; but it may always be made of much more value. When kept clean, the ſtraw will maintain a much greater quantity of cattle; and if there be leſs manure, it will be better, and there will be much more profit from the carcaſes of the cattle. I know a farmer, who, laſt winter, took in four oxen for 20 weeks, at two ſhillings per head each, that is eight pounds. Theſe were in a fold-

garth

garth. I believe it is no unreaſonable* ſuppoſition, that the ſtraw trod underfoot by theſe oxen would have kept other two oxen if tied in the ſtall; that is, would have given the farmer four pounds more.

P. S. The inconveniencies which attend fold-garths, begin to be now ſo well known, that a tenant on this eſtate of a farm of two hundred pounds per annum, who milks above twenty cows, and breeds in proportion, has not a ſingle fold-garth. If they are any where adviſeable, it is where a large quantity of beans are grown, the ſtraw of which being ſcarcely fodder for any cattle, is beſt wrought into manure in a fold-garth. But even in this caſe, the ſtraw may ſerve for bedding in ſtalls, and the inconveniencies attending all fold-garths ſeems greatly to preponderate.

ARTICLE. XLV.

On the benefit of Soap-Aſhes as a Manure.

[From MUSÆUM RUSTICUM, VOL. V.]

I Do not remember to have ſeen any thing in your work on the ſubject of that excellent manure called ſoap aſhes; I mean thoſe which are made by the ſoap-boilers in London.

I have, many years paſt, received great benefit by uſing this manure, with which I almoſt conſtantly dreſs my wheat-lands, but never, on account of its hot burning quality, uſe it alone. My

* Let the reader conſider, that whatever ſtraw is either thrown by the ſtand hecks, through negligence or incapacity of the ſower, or accident, or the wantonneſs of the oxen being once mixed with the ſoil, or trod under foot, becomes uneatable, all animals having an averſion to what ſmells of their own urine. Let him alſo reflect, how much ſhort ſtraw equally eatable with the reſt is loſt, and he will probably think that I calculate very modeſtly.

My method is, to make a large heap of dung and earth, that is, two loads of earth to one of dung, placed in alternate layers to rot. After this has undergone a ſtrong fermentation, I cauſe the whole heap to be turned and well mixed, leaving it ſome time longer to mellow.

I then procure the ſoap-aſhes, and mix them with the compoſt, in the proportion of one load of aſhes to ten of the compoſt, leaving, for ſome time, the whole to mellow together.

When wheat ſeed-time comes, about the latter end of September, I cauſe about ten cart-loads of this rich compoſt to be laid in little heaps on each acre of the land I intend to ſow with wheat: this manure is immediately ſpread, and, ſowing my wheat broad-caſt, I plow it in together with the compoſt.

The advantages reſulting from this practice on ſtiff ſoils are many; and particularly, if the farmer is in the leaſt careful in preparing his tilth, he will have a clean crop, free from ſmut or weeds; a matter of no ſmall conſequence to him.

I have tried this manure on lighter lands, and find it anſwer extremely well, provided it has lain a conſiderable time in the compoſt-heap to mellow and abate its natural heat; but it agrees beſt by far with clayey ſoils, and in ſuch is well worthy of being recommended as an excellent dreſſing for a wheat crop.

SCOTS FARMER,

JUNE 1774.

ARTICLE. XLVI.

FARMERS KALENDAR.

JULY.

Farm-Yard.

THE compoſt raiſed the preceeding winter in the yard being carted on to the land, you may now, if you have leiſure, begin to cart in the layer of turf, ditch earth, chalk, marle or clay, upon which you are to fodder the ſucceeding winter. There is no neceſſity of performing this work in July; but as it may probably prove a leiſure time for the teams, it is mentioned as a buſineſs that ſhould be in hand, as a prevention of their ſtanding ſtill. It ſhould be executing from this time till the end of September, as the importance of it is very great, being the ſource of the moſt material improvements on a farm, it ſhould be reſolved on early, and executed with all poſſible ſpirit.

Turnips.

Now you muſt hand-hoe your turnip crops; a work perfectly underſtood in many parts of the kingdom; but ſo much neglected and unknown in others, that it will be proper to enlarge a little on the method of performing it, and on the neceſſity of the practice.

Suppoſing turnip-hoers to be ſcarce, or to demand ex-

travagant prices, or none to be had, order ſome hoes to be made by your blackſmith, the iron part exactly 12 inches long, and three or four broad, neatly done and ſharp: put handles five feet long in them. So provided, take your men into the field, and yourſelf with a hoe ſhould accompany them, make them hoe the crop boldly, and not be afraid of cutting too many up: direct them to ſtrike their hoe around every plant they leave, and fix upon the moſt vigorous and healthy growing ones. By this means, they will not be able to leave them leſs than fourteen inches aſunder; for their hoes ſpreading at every cut twelve inches, they cannot ſpoil your crop by not cutting freely. This work muſt be done by the day, and you muſt attend the men well, to ſee that they cut the land pretty deep, ſo as to kill all the weeds, and alſo ſuch turnips as they ſtrike at. In about a fortnight after, ſend them in again to rectify former omiſſions: in which time they muſt break all the land again with their hoes, cut up the remaining weeds, and, wherever the turnips were left double, thin them. The men will be aukward at this work the firſt year; but by degrees they will be able to do it in perfection, and by mixing new ones among them every year, the art will not be loſt.

In countries, where turnip-hoeing is commonly practiſed, the work is generally done by the piece: four ſhillings an acre for the firſt hoeing, and two ſhillings and ſixpence or two ſhillings for the ſecond, are common prices. Where this is the caſe, the farmer's principal attention ſhould be to ſee that the work is well done; for in all theſe operations, the fellows are extremely apt to run over their work in a ſlovenly manner, aiming only at making good earnings: The farmer ſhould ſee, that they cut up all the weeds, and leave the turnips every where ſingle. The crop muſt have two hoeings, which ſhould leave it perfectly clean, and the plants all at regular diſtances.

Cabbages.

Cabbages.

The crop planted in April or May, muſt be looked to this month; as they were both hand and horſe-hoed in June, perhaps they will not want any more culture till Auguſt, but this depends on the ſeaſon; if the weeds grow let them be killed; for the beſt rule in this matter is to hoe ſufficiently, to keep the crop perfectly clean, and to horſe-hoe whenever the intervals are at all bound by rains or otherwiſe.

The crop planted laſt month muſt be hand-hoed before the middle of this; in which work you ſhould be attentive to cut up all the young weeds that grow near the plants, and break all the land on the tops of the ridges; but the men need not hoe the ſides of them, or the furrows, as the plough in horſe-hoeing will cut them much better. Some freſh earth ſhould alſo be drawn to each plant, earthing it up as it were. The firſt horſe-hoeing ſhould be given ſoon after; in which operation, the plow ſhould take off a furrow from the ridges on each ſide, and throw up a ſmall ridge in the middle of each interval, which will let the ſun into the earth, on which the plants ſtand, and pulverize and ſweeten it. The cabbages will be left on a narrow ſlip of earth ready for the ſecond hand-hoeing, which will be given with great eaſe.

Potatoes.

The crops of potatoes, planted in rows, muſt have a third horſe-hoeing this month. The common way of plowing backwards or forwards every time of horſe-hoeing is not well adapted to this crop; for cutting the roots, when the plants are in full growth, hurts the crop, you deſtroy runners, that would produce potatoes. For this reaſon the third horſe-hoeing ſhould be given firſt with an inſtrument, called a cultivator, of which there are very many ſorts, but

they

they all agree in the circumſtance of cutting and looſening the earth, without turning it over, or forming any ridge. Some of them work with many little triangular ſhares, ſome with ſingle flat ones, and others only with coulters; but any of them that cuts up freſh moulds at the bottom of the furrows, will anſwer the purpoſe. A double mould-board plough (a common inſtrument in ſome counties) ſhould follow the cultivator in about a week, and ſtriking the furrows, throw up all the looſe earth againſt the ridges, banking them up. There is a great uſe in this operation; for it throws up freſh earth for the roots to ſhoot into, which is preferable to taking it away from them, after they have advanced at all in growth.

Lucern.

The drilled or tranſplanted lucern will be ready to cut again this month, the intervals muſt be directly horſe-hoed the contrary way to the laſt. In reſpect to hand-hoeing, the beſt rule will be, to do it according to the growth of weeds. There is no neceſſity for it while the rows continue clean: the weeds that ariſe among the plants in the rows ſhould be plucked out, and particularly all graſſes, which are the greateſt enemies to this crop.

Mow Graſs.

All meadows and paſtures not mown in June ſhould be cut this month. Hay making being in many ſeaſons ſuch tickliſh work, and ſo extremely expenſive, the farmer ſhould take care to manage it with as good contrivance as he can. To have a plenty of hands is a material point; for, if good uſe is not made of favourable days, the work will certainly be unprofitable. In order to this, the farmer ſhould have ſome other work always in readineſs for his people, in caſe the weather is too wet for hay making. For

men,

men, he may have compoſt hills to turn over and mix, borders to grub or dig up, carting manure, &c. Women he may employ in ſtone-picking, weeding, &c. When many hands are kept, this management will ſave much uſeleſs expence. In the making the hay, the getting it at laſt on to the large cock ſhould never be omitted. Many farmers only run it up in broad rows, and load from them on to the waggons; but it is better to employ all the hands in cocking it; for if the cocks are large and well made, the hay will take no damage in them, even in very heavy rains; and by all the men being ſo employed, much the more hay will be ſecured. Where the labourers will take the work of hay making by the piece, it is adviſeable to put it out to them at ſo much an acre: for inſtance from five to eight ſhillings, for mowing, making and cocking.

The Teams.

All this month the horſe and ox-teams ſhould be ſoiled daily with lucern in the houſes or yards; but if in the latter, they muſt have water always at command, and alſo ſhades for ſhelter; and if the farmer does not provide plenty of litter for treading into dung, he neglects the principal part of his profit. Lucern is the beſt plant for this purpoſe, and an acre of it will go much further than of any thing elſe. Sainfoin is good, ſo is clover; and tares mown every day will anſwer well in the ſame uſe; in want of theſe give natural graſs: but any of them are better with plenty of litter for dung, than turning the horſes or oxen into the field. However, if litter is not kept in plenty, then it is much more adviſeable to turn out.

The Fallows.

Have an eye to your fallows this month, and do not follow the example of thoſe farmers, who totally neglect them

them for works of hay and harveſt. A farmer carries on his buſineſs very unprofitably, if he does not keep men and horſes enough for all works: it is unpardonable to ſuffer the fallows to be over-run with weeds at this time of the year: they ought to be in a fine ſtate of pulverization.

Some excellent huſbandmen, on very ſtiff tenacious clays, that run much to couch and twitch-graſs, aſſert, that the fallows ought to receive the ſecond plowing the beginning of June as deep as poſſible, which leaves the field all in immenſe clods; theſe ſhould roaſt in the ſun until the end of Auguſt at leaſt. They aſſert, that ſuch management kills all couch and twitch, which would vegetate and encreaſe infinitely, if the land was made fine before the heat of ſummer came on. But there are many objections to this plan, ſuppoſing the fact true of its killing the couch. You lock up all the ſeeds of weeds in the clods, at the ſame time that you deſtroy the couch; ſo that on ſowing your wheat, before which the land is made much finer, they all vegetate with the crop. Another very great objection is, ſo much of the ſoil loſing the benefit of the ſun's acting on it, during the hotteſt of the ſummer months. If the land is really improved by the air in ſummer, ſweetened, ameliorated, or any ways enriched, ſurely it muſt be in proportion to the number of particles expoſed to its influence. The ſun penetrates deep in well pulverized ſoils, but has little effect in clods as hard as marble. Theſe obſervations are not offered as proofs, that the above mentioned farmers act abſurdly; for on certain ſoils, not very general, their practice may be juſt: but I think that ſuch opinions ſhould, by no means, be generally adopted on all ſtiff ſoils, for the reſult might then turn out very diſadvantageous.

Folding.

This month folding ſhould be followed with unremitted dilligence; the lands uſually fixed on for this purpoſe, are

he wheat fallows, which is very judicious in thoſe farmers, who have no crop ſown between, or turnips and wheat, and who cultivate no graſſes in the horſe-hoeing way; but let the attentive accurate husbandman lay it down as a rule, ever to fold thoſe lands firſt, which will be firſt ſown or plowed. During this month, he ſhould fold ſuch fields as are deſtined for Auguſt, ſown graſſes of whatever ſort, or lucern plantations, juſt cut, and ready to be horſe-hoed: By theſe means the crops are immediately benefited by the practice; but if the manure is left above ground, to have its virtues extracted by the ſun, the benefit reaped by the crop, will not be near ſo conſiderable.

Dig Manures.

Do not let the marle, chalk, mud, or clay carts ſtop this month: it is a very proper ſeaſon for the work, and ſhould be purſued with ſpirit while the ſeaſon admits it on all ſoils: I ſay, on all ſoils, becauſe in winter, wet or heavy ones muſt not be carted on. Theſe manures, though expenſive at firſt, are cheap in the end, for they laſt many years. In all works of carting, attend particularly to the employment of your team; uſe as few horſes as poſſible. For this purpoſe, the ſmall three wheeled cart is excellently adapted: one horſe is ſufficient for two of them: one is loading while the other is driving away, by means of the third wheel, which ſupports the weight of the cart and load, inſtead of the fill-horſe in large carts: they do not hold more than fifteen buſhels, and the wheels ſhould be nine inches broad: a great excellency, as ſuch will do for winter-carting on graſs-lands, without poaching or otherways damaging the graſs. If the draft is not diſtant, four or five men will thus be employed by one horſe, which is an excellence that no other machine can boaſt. Now, let any attentive cultivator reflect on the importance of an odd horſe performing all the carting of a farm, while the others are going regularly on with their tillage, or road work. Whoever will conſider this

this compariſon, in the proper light, will be ſenſible, that it is much the moſt œconomical way of carrying on buſineſs.

Barley.

Some of your barleys will probably be ready for mowing towards the latter end of this month, particularly the Fulham ſort, which is frequently cut the middle of July, a fortnight before any other ſort, though ſown at the ſame time, and on the ſame land. This early mowing has ſeveral advantages, many weeds are cut before they ſeed, which, in a fortnight longer, would ſhed, and conſequently injure the enſuing crops. The trouble and attention of harveſt is leſſened; for a part, at leaſt of the barley crop, may be in the barn, before other farmers, who do not uſe this ſort, begin to mow.

Wheat.

Auguſt is the principal month for cutting wheat, under which head I ſhall treat of it more particularly. I mention it at preſent, merely to conſider the conduct of many ſenſible farmers, who are fond of cutting their wheat, at leaſt ten days before it is abſolutely ripe. There is reaſon to think this practice a very good one; the corn is left in the field longer than common, to finiſh in that manner the ripening: The advange is the fineneſs of the grain. If you are deſirous of carrying to market a ſample of wheat, that ſhall exceed all others, it muſt be thus harveſted; and I have more than once heard ſeveral very attentive farmers aſſert, that they loſe nothing in meaſure by this management. It is at leaſt worthy the trial of all good husbandmen, were it only for the convenience of ſomewhat dividing their harveſt. The laſt fortnight in Auguſt is ſo buſy a time, that many of them ſcarcely know how to get in their corn, upon account of all ſorts then requiring attention at once.

ART

ARTICLE. XLVII.

Of the culture of Flax or Lint.—Of the culture of Hemp.

[From DICKSON'S AGRICULTURE.]

THIS plant, though very different in its uſes from thoſe that have been mentioned, yet falls within this claſs, as the ſtalk is the principal part of it, and as the principal uſe of the ſeed is to produce the plant. Though it is not proper for food either to men or cattle, yet a good crop of it is perhaps as valuable as any crop whatever.

Great encouragement has been given by the government for the culture of this plant, yet it has not made very great progreſs. A very ſmall part only of what is manufactured in Scotland, is raiſed in the country. We are provided chiefly from Holland and Ruſſia at a very great price. Whether or no the demand has lately encreaſed much, or whether any other cauſe can be aſſigned, I know not; but it is ſpoke of as a thing certain, that the price of lint has in a few years advanced near 50 *per cent.*

I am at a great loſs to aſſign a reaſon for the ſmall progreſs that the culture of this plant makes in Scotland. Premiums in different ſhapes have been given. They have been given to every farmer, that raiſed one acre and upwards; for every acre that he raiſed, a certain ſum. They have been given to perſons for purchaſing a certain number of acres, and manufacturing the produce of them. They have been given to perſons for the erection of milns for dreſſing lint, to leſſen the expence of manufacturing: and they have been given to the perſons that raiſed the greateſt quantity of green lint upon the acre.

It is no part of my province to attempt to aſſign the reaſons that have prevented the culture of flax, notwithſtand-

ing all theſe encouragements. I muſt however obſerve, that it is a very great diſgrace upon our country, that when encouragements were offered, men ſhould be found, who, inſtead of ſtudying to deſerve them by vigorous attempts to promote the culture of this plant, ſhould only contrive how they might gain them by fraud, and that they ſhould find perſons in a higher ſtation ſo eaſily impoſed upon as to atteſt their frauds as facts.* It is certain, that certificates were produced of crops of lint of value far ſuperior to any thing that has been mentioned of lucern; and I may almoſt venture to ſay, of twice the value of the land upon which it was raiſed. I mention this, becauſe I think it is the duty of every man, when encouragements are given to induſtry, to prevent, as far as he can, the public from being impoſed upon, that ſo the good end propoſed may not be fruſtrated.

I muſt obſerve likewiſe, that there is little ground to hope, that any plan for this purpoſe will ſucceed, unleſs ſome method can be fallen upon to make the raiſing and manufacturing of lint two different employments, carried on by different perſons, fitted for each part, and properly ſituated for the buſineſs. Every perſon that knows the various operations neceſſary to be performed on lint, muſt ſoon be convinced, that the raiſing it in the field, and preparing it for the cloath manufacturer after it is raiſed, are very different employments, and ſhould be carried on by different perſons. At preſent the whole is carried on by one perſon: and this perſon is either almoſt entirely unacquainted with agriculture, and is obliged to hire the neceſſary labour at the greateſt expence; or if he is acquainted with agriculture, and can raiſe the crop of lint at the ſmalleſt expence; yet having already a great deal of other important buſineſs,

* The truſtees are ſo ſenſible of theſe frauds, that they have not continued to offer the premiums.

buſineſs, he cannot think to give himſelf much trouble with any work, that interferes in any degree with his chief employment. Yet this the farmer muſt do, if he engages with lint. The pulling, watering, and graſſing interfere with the moſt important buſineſs of the farmer, the making his hay, and the cutting down and ingathering of his corn. This makes him averſe to meddle with lint; and if he ſhould engage with it, makes it impoſſible for him to give that attention to it, that ſome of the operations mentioned require.

While matters then continue to be carried on in the way they are at preſent, I am afraid that the culture of flax will not make great progreſs. But could perſons be found for purchaſing lint upon the ground, and could habitations be aſſigned them in proper ſituations, ſo that they might, by water-carriage, or ſome other eaſy manner, bring home the lint from the different parts of the country, to be watered and graſſed immediately under their own inſpection; there is reaſon to believe, that the farmers would raiſe as much lint as ſhould be found neceſſary for our manufactures, or would be proper for their land to carry.

When premiums were given to perſons for purchaſing a certain number of acres, and manufacturing the produce of them, ſomething of this kind was attempted; but then no care was taken in the choice of the perſons to whom theſe premiums were given, or to have them properly ſituated for their buſineſs.

The ſcheme at preſent propoſed of making a canal betwixt the Forth and Clyde, offers an opportunity to promote the culture of lint in the manner here mentioned †. It is propoſed, that this canal ſhall paſs through lands, that at preſent produce the beſt lint in Scotland; and by forming it, and

† This was written before the act of Parliament, for making this Canal, was obtained.

and providing it with water, ſome other lands, at preſent lying wet, may be rendered proper for this purpoſe. Habitations for lint manufacturers may be made in ſome convenient places on the ſide of the canal, to which green lint may be brought by water-carriage from any of the lands that lye near to it, or even on the ſides of the friths at a ſmall diſtance from the ends of it. By this means, tho' the lint may be raiſed at a conſiderable diſtance from the purchaſer, yet he can bring it to his habitation at a ſmall expence, and have it watered, graſſed, and dreſſed, immediately under his own eye. If there is the ſmalleſt probability that ſuch a ſcheme may take place, it would be proper to put a clauſe in the canal bill, to allow all green undreſſed lint to paſs free from toll.

It is probable, that on the ſides of ſome of the lochs in the weſt Highlands, proper habitations may likewiſe be found for lint manufacturers. The climate is very proper for lint, and the ſoil in ſome places may be found proper for it alſo; the land is generally low rented, and the navigation upon the lochs will enable the manufacturer, at ſmall expence, to bring to his habitation the lint that he purchaſes even at a diſtance.

If a manufacture of this kind is eſtabliſhed by a ſociety, encouraged by the public, though it may not ſucceed at firſt, yet it will point out to private perſons how they may carry it on afterwards to advantage.

But though the farmer may not receive this encouragement, it may not be amiſs to give ſome directions about the culture of this plant.

The firſt thing to be conſidered, is, the ſoil that is proper for it: Where land is in conſtant tillage, there are not many ſoils on which it will ſucceed. The one moſt proper is a deep, moiſt, rich ſoil, made as free from weeds as poſſible: Land newly broke up, though it is not ſo good,

anſwers

anſwers very well, provided it is deep, and not too dry.

The farmers in Scotland have ſeldom been at any pains either in the choice or preparation of their land for a crop of lint. They ſeem always to have conſidered it as a crop, upon which very little depended, and therefore have been always leſs anxious about the ſucceſs of it, than of any other crop. Were they at as great pains to prepare their land for a crop of lint, as they are for a crop of wheat or barley, they would undoubtedly ſucceed: But the uncertainty of a market for it upon the ground, the trouble it occaſions if obliged to dreſs it themſelves, and the length of time before they receive a return, prevent them from ſowing it upon good land, or being at much expence in its culture.

Such is the nature of the crop, that it merits to be raiſed on land prepared by a fallow. If the land is not fallowed, it ſhould be in good order, and receive a plowing before winter, that ſo it may be properly mellowed by the froſts. Upon this winter-furrow the ſeed may be ſown if the land is very clean; if not, it ſhould get a ſecond plowing at ſeed-time. When lint is to be ſown upon land newly broke up, the land ſhould likewiſe be plowed before winter, that ſo the harrows may be able to break the turf compleatly. Unleſs this is done, a good crop cannot be expected. However, one plowing in this caſe is ſufficient; for if the land is in good order, and there is any froſt in the winter ſeaſon, the turf will be eaſily torn in pieces by the harrows.

In ſowing, the lint muſt be treated like graſs-ſeeds. The land muſt be harrowed, and well ſmoothed before the ſeed is ſown; and then another ſlight harrowing given to cover it. All the clods muſt be well broke, and all the ſtones gathered off, that ſo the ſeed may come up the more equally.

The proper time for ſowing is in March, or in the beginning of April; and about 12 Linlithgow pecks, barley meaſure

meaſure, is the proper quantity for an acre, adjuſted accor-
ding to the ſituation of the land. The richer that the land
is, provided it is not too open, the greater quantity of ſeed
in proportion ſhould be ſown. Lint in this reſpect is very
different from corn. In ſowing corn, the richer that
the land is, the leſs ſeed is required; becauſe the richer
that the land is, the greater number of ſtalks come out
from the root. But in ſowing lint, the richer that the
land is, the more ſeed is required, becauſe one grain of
ſeed produces no more than one ſtalk, and the richer that
the land is, it is able to nouriſh the greater number of
ſtalks. Beſides it is found, that the thicker the lint grows,
provided it does not lodge, it is always of the better qua-
lity.

If the land intended for lint has been in tillage, though
great pains may be taken to deſtroy the weeds before the
lint is ſown, yet ſo many will riſe with the crop, as to ren-
der it neceſſary to pull them out. This is commonly done
by the hand; and, though expenſive, may be done without
any danger. The Engliſh writers on Agriculture pro-
poſe to turn in ſheep upon the lint, and they aſſure us
that if this is done at a proper ſeaſon, they will eat up the
weeds without doing any hurt to the lint. But I am per-
ſuaded, that ſheep are unſkilful weeders, and though they
ſhould do no hurt to the crop of lint, would not ſuffici-
ently deſtroy the weeds. It is a little ſurpriſing, that the au-
thors of the compleat body of huſbandry ſhould think, that
this method in ſome caſes will do very well, when at the ſame
time they condemn the ordinary method of pulling out
the weeds by the hand. But notwithſtanding what they
alledge, yet there is no danger in going amongſt the lint
and even ſitting down to pull out the weeds if neceſſary;
for though the lint ſhould be even more than three inches
long when laid down, yet it riſes again in a few days.

Mr Tſchiffeli ſays, that lint ſhould be weeded when it

our inches high, and that there is no danger of its being damaged, that the weeders ſhould always go bare-footed into the field, and ſhould work as much as poſſible ſitting or lying down. In Scotland, they ſit upon their knees, as the poſture in which they can moſt eaſily move forward.

There is nothing in the culture of lint that we ſeem to be leſs acquainted with, than the proper time of pulling it; yet it is certain that a great deal muſt depend upon this. When lint is intended for ſeed, it is eaſy to know when the ſeed is ripe; but at what time the ſtalk has the greateſt plenty, and the beſt lint upon it, is not ſo obvious. When treating of the culture of the different graſſes, it was obſerved, that the ſtalks of graſs become worſe, and contain leſs nouriſhment, in proportion as the ſeeds are advanced. There is reaſon to believe the ſame thing with reſpect to ſtalks of lint, that the further that the lint ſeed is advanced there is the leſs lint.

Perhaps it may be neceſſary, that ſome of the juice be extracted from the lint, to give it proper ſtrength. Was it not for this, which may be true, though not very probable, I ſhould recommend to pull the lint as ſoon as the flower has fallen, as the time when there is the greateſt plenty, and the beſt lint upon the ſtalk; it is certain, that it ought not to ſtand long, for it is known to be the practice, in thoſe places where they have the beſt lint, to pull it before the ſeed is compleatly ripe. This practice ſerves another good purpoſe; the land is not ſo much exhauſted by the crop, when the lint is pulled ſoon, as when it is allowed to ſtand and perfect its ſeed. Some regard ſhould be paid to the land in determining the time of pulling. It is certain that lint is a very ſevere crop, and requires as much nouriſhment as any crop raiſed in our fields. When the land on which it is ſown is rich, and full of weeds, there is commonly a good crop of barley after it. By the crop of

lint

lint the weeds are deſtroyed, and the crop being early ta
ken from the fields, the land gets a kind of ſummer fal
lowing. This has led ſome into the opinion, that lint i
not hurtful to land. but thoſe farmers that have made th
moſt frequent trials, are now fully convinced of its ſeve
rity.

The opinion that lint is a ſevere crop is agreeable to wha
the antients write concerning it. Virgil ſays, that lint burn
the ſoil. Collumella ſays it muſt not be ſown except i
brings great encreaſe, and the price it bears invites, for, a
bove all other ſeeds, it is hurtful to lands.

However, in land proper for lint, the farmer may ſow i
in a courſe with other crops, and in diſpoſing of his cro
he may ſell it a little the cheaper the earlier that it is to b
pulled, for when the lint is early pulled, he may expe
the better crop after it.

Of the Culture of Hemp.

Hemp is of the ſame nature with lint, only much coarſe
and ſtronger; and wherever there is ſhipping and a fo
reign trade, there is great demand for it. There is very litt
of it raiſed in Scotland. Whether our ſoil is not prope
for it; whether we are unacquainted with the culture of it
or whether we have not as yet learned the proper way o
dreſſing it, I ſhall not pretend to determine.

Hemp is a plant that was cultivated by the Romans. Co
lumella ſays that it requires fat, well dunged, and well wa
tered ground; or that which is flat, moiſt, and manure
very deep. He adds, that it was ſown in the month of F
bruary at the rate of ſix grains upon a foot ſquare. Hem
puſhes down one large root, and therefore requir
a deep ſoil. It is obvious from its appearance, that it take
a great deal of nouriſhment, and therefore requires likewi
a rich ſoil.

Th

The ſeaſon for ſowing it, is in the firſt of April, and, in ſowing, it muſt be treated like lint. The land muſt be well harrowed before ſowing, get a ſlight harrowing after, for covering the ſeed; the clods muſt be well broke, and the ſtones carried off. As the ſeed is ſown thin and not covered deep, and as birds are very fond of it, it becomes neceſſary to watch it till it begins to ſpring.

There are two kinds of it called the male and the female, which grow promiſcuouſly from the ſeed that is ſown: one of theſe only carries ſeed. The one that carries no ſeed is much ſooner ready for being pulled than the other. This occaſions great difficulty in pulling. For when when the two kinds ſtand promiſcuouſly on the field, it is difficult to pull up the one kind without doing much hurt to the other. This has made ſome perſons propoſe horſe-hoeing as the proper culture for this plant. For though it is a tap-rooted plant, and has only one ſtem like the lint, and cannot be ſuppoſed, for that reaſon, to receive very great benefit from the horſe-hoeing culture; yet the alleys allow what is early ripe to be pulled up, without doing any harm to that which is allowed to remain, and the horſe-hoeing muſt occaſion a very great encreaſe of ſeed.

Whether or no the kind that carries the ſeed would produce a larger quantity and better hemp, if pulled up before the ſeed is ripe, is an important queſtion, and may be determined by proper experiments. If it is found to do ſo, then both kinds may be pulled, when the earlieſt or male kind is ready. A ſmall quantity may be allowed to ſtand for ſeed, which I am perſuaded, that, by proper culture, may be made to produce as much ſeed as is raiſed at preſent from a very large quantity by the ordinary culture. However, with reſpect to this, nothing but conjecture can be offered till proper trials are made.

ARTICLE XLVIII.

Advantages of cultivating Flax;—and Directions for the management of that moſt uſeful vegetable.

FLAX has been held in the higheſt eſteem from al antiquity, being celebrated as one of the great ſta ples of Egypt, and from the manufacture of which, aroſ one of the moſt lacrative branches of her commerce. I is thought to require a very deep, rich, and warm land but we know from experience, that, with proper ſkill an attention, it will thrive exceedingly well in almoſt ever ſoil throughout the Britiſh iſlands. It is indeed true, tha the ground which is to produce flax, ought to be ſevera times carefully plowed, ſo as to render it perfectly fine and muſt then be laid as ſmooth and even as poſſible. I may be ſown about three buſhels on an acre, in the firſ warm weather after the middle of March; and, if rain ſuc ceeds, it muſt be kept free from weeds till it riſes about two inches high. In ſome places they have ventured in thi ſtate to feed it with ſheep, and this without prejudice. I is ripe ſomewhat later than hemp, and when ripe is to b pulled as expeditiouſly as poſſible, and then laid in ſmal parcels, evenly, with the head towards the South, that i may dry conveniently. It affords after this a great dea of employment, in watering, pulling, breaking, &c. which is certainly an advantage, as it ſupplies labour, and of courſe ſubſiſtence, to many poor people; and, when all this i done, is ſeldom leſs than ten pounds an acre, But when we conſider the benefits that ariſe from the commodity when it comes into the hands of the manufacturers, and the multitudes that get their bread by ſpinning, weaving and bleaching in it; it muſt appear to be a national object o the greateſt importance; and the more ſo, as there is no a probability only, but a certainty, that, with proper en-

couragemen

ouragement, it might be made as much a Britiſh ſtaple as
ool. On this account it deſerves, and ſurely the time is not
r diſtant, when it will meet with the utmoſt attention, the
nly thing requiſite to put it effectually in our poſſeſſion.
It is owing chiefly to ſome ill founded prejudices, that
is not already ſo; and a greater ſervice could not be
endered to the public, than by removing theſe prejudices,
ot ſimply by arguments, but by experiments, which would
ut the fact entirely out of doubt. The Dutch, who un-
erſtand both the culture and manufacture of flax better
han any other nation in the world, prefer their own ſeed,
aiſed on the ſtiff clays of Zealand, to any that they re-
eive from the northern parts of Europe; though they
lſo drive a great trade in this. But the flax employed in
heir manufactures grows on a light, warm, gravelly ſoil,
nd owes its beauty and fineneſs to their ſedulous care in
manuring, cultivating, making it properly in the field, and
n the dreſſing it afterwards. They likewiſe carefully
guard againſt an error into which we frequently fall; which
is, the pulling the flax too green, by which, in the firſt place,
the ſeed is loſt, and, if preſerved, is of little value, in re-
ſpect to the producing another crop. The occaſion of
this error was the fairer appearance of flax, when thus
pulled, than when ſuffered to ſtand longer. But this ad-
vantage was ſimply in appearance, ſince the green flax
loſes more in the dreſſing, and has never that ſtrength in the
thread, which it would have if pulled in a more mature ſtate.
We have the ſame diverſity of lands, and much more of
them, than the Dutch; and therefore, if we took equal
pains, there is no reaſon to doubt, that we might ſucceed as
well as they; and that, by changing our own ſeeds, we
might be releaſed from the neceſſity of importing them,
as well as flax, for our own uſe; and, when the conſe-
quences of this ſhall be duly conſidered, there is very little
room to fear, that every obſtacle may not be overcome ---

ARTI-

ARTICLE. XLIX.

An ESSAY *on the* MANAGEMENT *of* HOGS; *including Experiments on Rearing and Fattening them:* By ARTHUR YOUNG Esq;

[*Continued from* p. 363.]

IN addition to the former experiments, I shall add a few that have been tried since.

I.

In January 1766, twenty pigs, that had been weaned six weeks, were draughted into four parcels, and kept for three weeks upon the following articles of food:

No 1. Boiled carrots.
2. ———parsnips.
3. ———red beets.
4. ———potatoes.

They were then viewed, and the result:

No 1. The best.
2. The next best.
3. The next; very near equal to No 2.
4. The worst, but very good.

The difference between them but little.

Carrots, in this trial, appear to be superior to the other articles——but not so much as to prove decisive.

II.

In February 1766, drew six lots of pigs, four in each—the equality very exact; and, confining them to separate sties, fed them in the following manner three weeks:

No 1. Raw carrots.
2. ——parsnips.
3. ——red beets.
4. Raw potatoes.
5. ———Jerusalem artichokes.
6. ——Turnips.

At the end of that time viewed them;

No 1. The best in good order.
2. — 3. Next; equal: these also in good order.
4. and 5. The next; equal.
6. Three dead; and the other dying.

Carrots,

Carrots, parſnips, and beets are excellent food; potatoes and artichokes the ſame, though in a ſomewhat inferior degree: turnips wretched.

III.

In January 1767, drew three lots of weaned pigs, and fed them a fortnight as follows:

No 1. With boiled carrots.
2. ——— parſnips.
3. ——— beets.

Viewed them at the end of that time; the reſult,

No 2. The beſt.
1. The next.
3. The laſt.

But all in good order. Parſnips, being ſuperior in this trial to carrots, contradicts, ſo far, the reſult of the former experiments; but a few trials muſt never be conſidered as deciſive. In all agricultural ones, the general averages are the points alone which carry conviction.

IV.

The 6th of January, 1767, confined ſix pigs, two months old, to a ſtye, and fed them for ſix weeks with nothing but boiled Jeruſalem artichokes, and the common waſh that is given to lean hogs, as a trial to diſcover how far that root may be depended on for feeding ſuch pigs. The reſult was favourable; at the end of the time they were viewed, and found to be in good order;—not ſo well looking, as I have often had ſuch pigs kept on other meat—but well enough to ſhew that this food is a matter of much importance.

V.

Sowed common red clover with barley in the Spring of 1765, on two acres of wood-cock, brick-earth loam, on a clay bottom, that yielded beans, horſe-hoed in 1764. In October 1765, manured it with thirty loads of compoſt, conſiſting of various proportions of farm-yard dung, town-manure, turf, ditch earth, &c.

The

The fences around it were well repaired in the winter; and one, much worſe than the reſt, new made. The 12th of May I turned in thirty head of ſwine, conſiſting of ſows, large pigs, and hogs half and three-fourths grown: they took immediately to the clover, and in about a fortnight, all diſcovered by their looks how well the food agreed with them; there was a pond in the field, at which they drank perpetually, and of nights they laid all of a heap in a corner of the piece; under a thicket of buſhes; not making any attempts to get home, after walking the firſt evening once or twice around the border with that deſign. Finding that ſtock of hogs inſufficient to keep down the clover, more were added; and ſome kept in the piece till Michaelmas. The account of the expences and produce is as follows.

Expences.

	l.	*s.*	*d.*
Seed	0	10	9
Sowing	0	0	6
Manuring, at 20*d.* a load the manure, and the expence of carting it to the field	2	19	4
	3	10	7
Rent	1	14	0
	5	4	7

Produce.

	l.	*s.*	*d.*
Keeping 15 hogs 21 weeks at 3*d.*	3	18	9
Ditto 12 ditto 12 weeks at 3*d.*	1	16	0
Ditto 10 ditto 16 weeks at 3*d*	2	0	0
Ditto 5 ditto 10 weeks at 2½	0	10	5
Ditto 12 ditto 10 weeks at 2*d.*	1	0	0
Keeping 10 hogs 12 weeks at 1½.	0	15	0
	10	0	2
Expences	5	4	7
Profit, 2*l.* 7*s.* 9½*d.* per acre.	L. 4	15	7

From

From the event of ſeveral other fields of clover this year, I am clear that no other uſe of it would have paid better than thus feeding it by hogs. A clear profit of forty-ſeven ſhillings per acre, after paying the expence of a good manuring, is conſiderable, and greatly preferable to the general profit by hay, the chance of ſeaſons taken into the account. Nothing can be clearer than the fact of hogs thriving excellently on clover——all theſe ſwine grew very faſt, and ſhewed by their looks how well the food agreed with them; and there is no animal that ſooner falls off in its appearance than a hog, when badly fed. Where therefore is the neceſſity of providing other ſummer food? Why conſume that food for thoſe hogs which clover will maintain, while ſows and pigs, and weaned pigs, cannot be kept without it, ſuch as dairy-waſh, &c.

This is a ſyſtem of management that will enable the farmer to keep much larger ſtocks of cattle than the methods yet common in ſo many counties.

VI.

In the Summer of 1767, kept as many hogs of various ſorts in one acre of clover, ſown with oats after turnips, on a good gravelly loam, as came to 4*l.* 8*s.* at the above prices. The hogs were in it from the laſt week in May to the middle of September, never at home. They throve extremely well, and no ſwine could look better.

Theſe trials, with many others, prove inconteſtibly, that clover, well fenced in, with a pond in the field, is to be abſolutely depended on for the Summer-food of hogs, without any aſſiſtance: and that ſuch an application of the crop will pay as well, and probably better, than any other.

ARTI-

ARTICLE. L.

A ſhort and eaſy Method of Making Hay to the beſt advantage.

IT being a duty incumbent upon every member of ſociety, to communicate his diſcoveries for public benefit, I ſhall make no apology for ſending you an account of my own practice of making hay, by which I not only ſave one third of the time and labour uſually employed in this article, but have my hay made better than when I followed the uſual method.

I mow my graſs, and then let it lye in the ſwarth till the dew is off the next morning, at which time I turn and ſpread my hay, and let it lie in the ſun till the after part of the day, when I take it up and cock it well, and never meddle with it more till I cart it into my barn, or ſtack it. If the weather be good, it will do well to cart, after it has ſtood three days in the cock.

This method, I have found, by five or ſix years experience, anſwers for any ſort of hay, except ſalt hay, and red clover; of the latter of which I have not had ſo long trial; but my clover hay was managed laſt ſummer in the following manner:

I followed my mowers as they cut the graſs, ſpread it as thin as I could, and before night put it in cock. The next day, after the dew was off, I ſpread it again; in the afternoon I cocked it a ſecond time, and meddled no more with it till I carted it.—The appearance of the hay ſince makes me judge that no man has better of the ſort.

The reaſon why I think my hay rather better, is, becauſe I take it for granted, that the more juice, or natural moiſture, we can retain in it, without corrupting and rotting the ſtalk, the richer and more nouriſhing it is. The too often turning and ſpreading hay in the ſun extracts too much of the richneſs thereof, and one day's thus lying will

ke away ſuch a quantity of the moiſt watery particles, as at the remainder is only ſufficient to raiſe a proper fer-entation thereof when in the cock, while the ſmallneſs of e body there keeps that fermentation from riſing to ſuch height as to corrupt it. After twenty-four hours, the rmentation will gradually abate; and the pitching of the y into the cart, and afterwards into the mow or ſtack, checks it, that it will not again riſe ſo as to be detrimen-l. Cattle are fonder of this hay than of that which is ade in the common way, and leſs of it will ſupport them.

Doncaſter. J. W.

ARTICLE LI.

Obſervations on the proper time of Sowing Barley.

rom Mr ARTHUR YOUNG's experimental Agriculture.]

OUR correſpondent RUSTICUS, having (p. 305.) requeſted us to furniſh our collection with extracts om Mr Young's experimental agriculture; and at ſame me ſent us ſome of the notes he had taken from it, particularly, the average products from ſowing barley at differnt times; we cannot more properly at preſent comply with is requeſt, than by inſerting Mr Young's obſervations ſubjoined to theſe experiments, which are as corollaries, deduced rom them, to be applied to practice.

The average product from ſowings in February is 12 ½

March	11 ¼
April	8 ½
May	6
June	3 ½

I apprehend it will not be thought eaſy, even to conceive ny thing more deciſive than this little Table: The reader

doubtleſs knows, that the proportions of theſe ſums are t
point of importance: inſtead of ounces call them buſhe
ſacks, or quarters. When a June ſowing yields three a
a half ſacks, a February one will yield twelve and a ha
and ſo on. But I ſhould obſerve ſomething on ſuch ve
early ſowing of barley as the month of February, becauſe
is very contrary to all common practice.

Theſe experiments include both a gravelly and a clay
loam; farmers in general occupy all kinds of ſoil, from d
ſands to exceſſive wet clays: the variations of ſoil, relati
to the time of ſowing, muſt never be forgotten. Februa
here appears to be the moſt beneficial ſeaſon; but need I o
ſerve, that there are many ſoils which will not admit ſti
ring ſo early as February; others that will not admit it ev
till April, without the management is previouſly concert
with ſuch a view; and that there are ſome ſeaſons in whic
no plough can ſtir in February: All theſe points ſhould
conſidered. There is nothing which opens a way to err
more than general maxims: Exceptions are always ſo n
merous, that they are nearly deſtructive of ſuch rule
The caſes in which barley ſhould be ſown ſo early as F
bruary, may, I apprehend, be gathered from naming a few
Firſt, When the weather is dry enough to plow the lan
without the leaſt poaching: This is relative to all ſorts
Soil. Second, Upon thoſe dry, ſound, crumbling clay
whether natural, or artificial through draining; that b
being thrown on to the ridge in autumn, will be ready fo
plowing very early in the ſpring: Theſe ſoils yield of a
others the greateſt crops of barley. Third, upon all dr
gravels, ſandy loams, &c. that admit plowing during mo
of the winter. In theſe circumſtances, and ſimilar ones,
appears from the preceeding experiments, that it is adviſ
able to ſow ſo early as February: Bad weather, ſuch a
froſts and ſnows, ſucceeding the ſowing, are no objection
No weather could be worſe than many weeks after ſevera

of the preceeding ſeaſons; nor have I ever perceived, that the corn ſuffered. Moſt farmers who live in countries where it is the cuſtom to ſow early, muſt by chance have known their barley fields frozen, or covered with ſnow, and that without damage. There may certainly be exceſſively ſharp froſts without ſnow, juſt as the barley is appearing above ground, that may poſſibly injure it: I will by no means aſſert the contrary, but I have never obſerved it.

But advantageous as very early ſowing undoubtedly is, yet there are ſome wet undrained clays, loams, chalks, &c. that will not admit it; and there are numerous farmers that are in a tract of management which excludes it. Land that is to be ſown in February, or even March, muſt have its tillage before that time: it is abſolutely requiſite to plow and ſow immediately in the ſpring; that is, to give no preparatory ſpring plowings: for ſoils which are apt to be the leaſt moiſt, will, after one or two ſpring-plowings, become abſolute mud, with every heavy ſhower of rain: and this will be in proportion to the degree of pulverization: conſequently the farmer has the beſt chance of a dry ſtirring the firſt: as rains, which afterwards would make the ſoil poach, will, before it is ſtirred, have no ſuch effect. I have often been caught with rains, in my ſpring preparation for barley, and yet oftener obſerved it among my neighbours, and the conſequence is always a very late ſowing, and infallibly a poor crop.

It is from hence to be concluded, that the true barley husbandry is, to get the land into the outmoſt degree of order intended, by October at fartheſt, in which month it ſhould be thrown into the narrow ridge, and thoroughly well water-furrowed, that it may lye dry all winter, and be ready for ſowing early in the ſpring: The plows, ſeedſman and harrows, ſhould then follow each other cloſe; that, if rain comes, it may find no land unprepared for it. A farmer ſhould not allow his men to go with the plows at

a diſtance from each other; (it is common for the men each to take his acre), but make them go very near, that the field may not, in caſe of bad weather, be left in ſtripes part ſown and part unſown, with the water furrows open in one place, and choaked up in another: It is a common error, but a very pernicious one.

According to the husbandry here propoſed, the farmer, if he will continue to take a crop of barley after one of any other grain, ſhould give the tillage immediately after harveſt and ridge up the land as I have juſt deſcribed in October: but the common method is very contrary; they leave the field in ſtubble all winter, for the paultry conſideration of feeding ſheep, delay the tillage till ſpring, and conſequently ſow late; whatever their crop, we may pronounce it trifling, to what it would be with different management.

The greateſt crops of barley gained in England, are in clay ſoils, well drained, that have a year's fallow, are ridged up in October, the manure carried on the firſt hard froſt, and plowed, and ſown as ſoon as dry enough, which is the end of February, or the firſt fortnight in March.

To argue againſt ſowing barley after turnips would be abſurd, but the turnip husbandry by no means allows of a good barley culture. There will be no difficulty in proving this ſatisfactorily to all my readers.

Turnips not a proper preparation for barley! That is very ſtrange! cries an hundred people, who have ſeen the barley following turnips, fed off by ſheep. I reply, that the manuring from the ſheep, which by the way exceeds moſt others, here gives the great crop of barley, not the turnip preparation. It would be anticipating my ſubject to offer to prove this at preſent by experiment, but reaſon will do it alone. Thoſe who argue ſo ſtrenuouſly for this common management, ſhould view the barley crops which ſucceed turnips when they are not fed off: Does the proſpect ſhew, that it is the turnips or the ſheep that occaſion the

the great crop of barley? In order for the compariſon, take a field half ſown with turnips, and half fallow, or any crop that exactly equals the turnips: Let them be fed off the land with ſheep, and the other half manured to the exact equality of that of ſheep; is it ſuppoſed, that the latter barley will not equal the former! If on heavy lands it follows a fallow, it will moſt aſſuredly exceed it.

But further: Suppoſe the turnips on account of the flock are kept, as they commonly are, till the end of March, or throughout April, what will the reſult be then? Why the barley will be inferior by a third to the other that is not prevented from being ſown earlier. It is a fact that cannot be diſputed, that the very beſt turnip culture of barley in the moſt kindly ſoils in England, witneſs for inſtance the beſt marled lands in Norfolk, the crop fed off with ſheep do not near equal the product of barley from ſummer-fallowed clays manured in a common way with farm-yard dung, and ſown ſo much earlier than the turnips will allow. Four quarters are a great crop in the beſt parts of Norfolk, they have ſometimes five; whereas in Eſſex drained clays, ſix quarters are a common crop, and eight often gained.

The great uſe of turnips are in January, February, March, and April: The farmers that have great flocks keep them as late as poſſible: In other words, they are not off the land, when the barley ought to be green as a meadow. How is it poſſible, ſuch a culture can be comparatively advantageous to barley? When turnips are kept ſo late, I ſhould apprehend it would be a particular advantage to let ſome other crop ſucceed them that will bear ſowing much latter than barley. Quære, For inſtance, if ſuch a crop of buck-wheat as would be gained on turnip land in fine order, would not much exceed in value the common barley crops that follow turnips? If it is conſidered, how little buck-wheat exhauſts the ſoil, I have no doubt of the point.

Upon

Upon the whole, the preceeding experiments prove, that the grand object in the culture of barley is to ſow early; and conſequently, that a farmer, whatever be his ſoil or plan, ſhould, if barley is his chief or an important aim with him, ſo prepare his land as to admit ſowing on the firſt ſpring earth, whether the ſeaſon allows it in February or in March; but later he ſhould not venture to ſow; at leaſt on ſuch ſoils as mine. The gaining good crops in April, or even May ſowings, does not prove the contrary, as ſuch events muſt be owing to extraordinary, natural, or artificial fertility; which would yield proportionably greater crops, were the ſeaſon of ſowing more advantageous.

ARTICLE. LII.

Of Paring, Burning, and Liming Moor Grounds.

[From YOUNG's Farmers Letters, Vol. II.]

THROUGHOUT all the north of England, the proper method of breaking up waſte ſoils is agreed, from a long courſe of uninterrupted experience, to be paring and burning; But as it has of late been the faſhion in the ſouth to explode this culture, ſomething muſt be ſaid to reconcile ſuch jarring opinions.

The advocates for this method of improvement, produce a vaſt range of experiments to juſtify the practice; whereas its enemies found their opinion merely on reaſoning. How is it poſſible, ſay they, that it can be profitable huſbandry to reduce an inch of the beſt part of the ſoil every fifteen or twenty years to the thickneſs of a ſheet of paper? The argument is plauſible; but what would be of twenty times the importance of an hundred arguments would be to produce a field of a thin ſtaple: *This land was once Good in the depth of ten inches of ſoil; it is now Bad from having*

ing but four. But no ſuch inſtances have, or can be brought. On the contrary, it is to be proved in all the countries where paring has been long in vogue, that very ſhallow ſoils have been many times pared within the memory of old men, who likewiſe retain the tradition of the ſame ſoil having long before their time received the ſame treatment; and yet remained at the former thickneſs.

But if the difference of the thickneſs of the turf pared, and the thinneſs of the aſhes ſpread, were the rule to judge by; the argument, in proving too much, would prove nothing. Many tracts of the ſhallow land in queſtion have been known to be regularly pared, and burnt once every twelve or fifteen years, for a century paſt. Now, ſuppoſing it had loſt two thirds of an inch every time, in only eight times ſuffering this operation, the ſurface muſt have been reduced ſix inches in thickneſs: But how does ſuch a ſtate of the caſe agree with the ſoil being at this day ſix inches thick, and well known never to have exceeded it? Which is actually the caſe with ſeveral tracts of land I have viewed both in the northern and weſtern parts of this kingdom. There is, in a word, great reaſon to think, that this practice does not at all diminiſh the ſtaple of the land.

Whether this be owing to the great crops it is enabled to yield, returning a proportioned part of themſelves to the earth again, which is the caſe with all ſorts:—Or whether the ſurface pared conſiſts not entirely of turf, or the bulbs of ſainfoine, with no earth at all, or at leaſt none reduced to aſhes, I ſhall not pretend to decide: but the latter circumſtance I think very probable: Turf, which is nothing but an aggregate of roots and bulbs, may certainly be burnt without any reduction of Soil. I am of opinion that Soil cannot be reduced to aſhes; but in this, experiment ſhould decide. A ſtrong confirmation of this notion is the well known fact, that land cannot be burned till it has acquired a turf; that is, till it has gained

gained the thickneſs which was deſtroyed by the laſt burning.

The efficacy of the practice is indiſputable; a middling quantity of aſhes is 500 buſhels per acre. Suppoſe a man, inſtead of paring and burning at 16 *s.* or 18 *s.* expence, would bring aſhes to his ground; he would no where be able to get them, carriage and expences included, under 6 *d.* a buſhel, which amounts to L. 12 - 10 per acre: It is evident enough, that ſuch a plan would never do.

But the grand point of paring and burning is the bringing waſte ſoils into culture, one may almoſt ſay, in a ſingle day: it is pared and burnt, once plowed, and ſown immediately with turnips; a crop which never fails after that management. Thus is the work done at once: But ſubſtitute the plow alone——what a tedious, complicated, expenſive proceſs enſues, to bring about a much inferior profit.

I have heard this husbandry ironically called Moſt Generous, *for you burn your own ſoil to diſtribute it to all your neighbours*. But thoſe who talk thus, know not what the operation is: The aſhes are not like thoſe of wood, that blow about like duſt; much of them conſiſts in half burnt roots and vegetables—or at leaſt of a groſs aſh, but little moved by the wind; but ſuppoſing it ever ſo light, who but the greateſt ſlovens leaves them to be blown away? On the contrary, they are immediately ſpread, and plowed in hot. We are not to condemn manuring with wood-aſhes, ſoot, or lime, and yet the wind affects all of them more than the aſhes in queſtion.

Another circumſtance, very important, is the great efficacy of this husbandry in deſtroying ling and other ſpontaneous rubbiſh, at the ſame time that all grubbs, worms, and inſects are killed; Theſe are advantages unequalled by any other mode of breaking up land.

For theſe reaſons, and a thouſand others too numerous

to

mention here, let me, on all accounts, adviſe the improver of theſe waſtes to adhere to a practice proved from innumerable experiments to be excellent, and not fly to ſchemes that are recommended by reaſoning alone. Let him cordially embrace a method ſingular in that admirable circumſtance, of reducing the wildeſt, blackeſt deſart, in the ſpace of a ſingle month, into profitable crops; a point ſufficient to overcome all the arguments againſt the practice, were every one true. I have actually ſeen a fine promiſing crop of turnips on land, that only a month before, was as black as night itſelf †.

The price of paring, burning, and ſpreading the aſhes in the moor countries, varies from 14 *s.* to 17 *s.* and 6 *d.* They perform it very well and effectually for that ſum, ſo as to have the plough follow them without interruption. This price is cheap; but yet from dexterity and cuſtom, they make ſuch good earnings at it, that many men apply for the work, the moment it is known that any is to be done; and I found from various enquiries, that there would not be any difficulty in having the largeſt quantity of land pared and burnt through a want of hands; however, I ſhall, to obviate accidents and objections, calculate

† One of our correſpondents pointed out this eſſay, and writes us, that he was laſt year induced by it, to try the experiment on ſuch ground as is here mentioned; which ſo far ſucceeded, that by the end of June his ground was fine as garden mould. The turnips indeed did not ſucceed: owing evidently to the whole ſoil being heated by the burning, and the dry weather at the time; they did not appear till near the end of July, when the rains became frequent: But he is confident had they got a ſhower ſoon after ſowing, he ſhould have had a plentiful crop.

at one pound per acre, a price that would at once dra all the parers in the country.

The benefit of this practice as a manure, is every da clearly ſeen by the vaſt crops which ſucceed it for ſom years. I have viewed many fields taken from the ver blackeſt moors that were croped, firſt with turnips, an then with 5, 6, or 7 crops running of maſlin oats, or bar ley-big, and laid to graſs with the laſt, reckoned by the far mers then in good heart,—and even with this manage ment, the graſs has been directly worth 15 *s.* an acre. A which is ſufficient to prove, that the ſoil muſt be in pro digious heart after this operation. It is true they lime a great deal, and of that manuring I ſhall ſpeak next.

Liming throughout the moor countries, has been lon the univerſal practice. In moſt parts of the Northern coun ties, they make it an univerſal manure; probably it is i cultivated countries, more uſed than it ought to be.

Many very ingenious men have ſtarted objections to li ming even moors; and they found their opinions, (fo they do not pretend to offer *experiment*) on the qualities o lime wherever found. They want to have it explained with philoſophical preciſion, how a body, that of itſelf is no foo for vegetables, ſhould prove ſo rich a manure.—Now am ſenſible of being very unequal to ſuch ſpeculative points and as I never conducted a ſeries of chymical experiment on lime, I conſequently cannot ſpeak from my own expe rience; but if we compare the qualities which chymiſt give to lime, with the nature of the moors, there will, I ap prehend, be no difficulty in accounting for the ſtrong effect which undoubtedly accrues from laying the one on th other.

The moors have ſcarcely any marks of former culture— no tradition gives the leaſt trace of culture. Hiſtory to th remoteſt periods gives no reaſons to ſuppoſe theſe parts o the country ever in a ſtate of cultivation; the greateſt tract

o

of them are in the mountainous parts of the northern counties, which, it is well known, were for ages over-run by frequent incurſions and invaſions of two neighbouring but hoſtile nations. In a word, there is much reaſon to ſuppoſe the moors at this day in the condition they were three thouſand years ago—with no other alterations than the cutting and ſpoiling the ſpontaneous growth by armies, or the poor for firing, and perhaps, in ſome inſtances, for building. They maintain ſome ſheep.

The ſoil, as I before remarked, is a black, looſe, ſpungy ſubſtance: I conjecture all theſe black parts to be literally nothing but rotten vegetables kept looſe and open by the roots of the ſpontaneous growth. Thus, in fact, the ſoil is a dung hill; an opinion not very contrary to reaſon, when the crops it yields are conſidered. However, land that has laid in ſuch a ſtate for a long ſucceſſion of ages muſt inevitably be rich: In the north, men are apt to give a ſhrug at the very mention of cultivating them: For my part, I conſider vaſt tracts of them as the richeſt ſoil in the iſland of *Great Britain*. "All rich ſoils in a ſtate of nature "contain oil," ſays an ingenious writer.

Next as to lime; one tells us—"There is a great at- "traction betwixt quick-lime, and all oily bodies; it unites "intimately with expreſſed oils." Again, "Its operation "is to exhauſt the earth of its oils. Lime laid on ground "wore out by continual crops, rather hurts it than im- "proves it; becauſe it does not meet oil or oleaginous "bodies to act upon and blunt it. The proper cure for "this, is to mix dung with the limes, ſo that it may have "ſomething to act on." And again, "Lime is a great diſ- "ſolver of all bodies, both vegetable and animal. In this "way it certainly operates in the earth, by diſſolving all ani- "mal and dry vegetable ſubſtances, and converting them to "the nouriſhment of vegetables, at leaſt ſooner than they "otherwiſe would be." In another place, 'By mixing itſelf

" itſelf with the oleaginous particles of the ſoil, and con-
" verting them to the nouriſhment of plants, lime becomes
" in this ſenſe, provocative to the ſoil."

Now, is it not ſufficiently evident from this deſcription of lime, that the effect of it on a ſoil in the rich ſtate of nature, that muſt abound with oil, muſt be very great? It is miſchievous upon worn-out land; for the ſame reaſon it is excellent on new. But even then, it is adviſeable, if dung is added, which is the addition of what the moory ſoil contains in the greateſt plenty. Further, lime diſſolves all vegetable ſubſtances, and prepares them for the nouriſhment of plants. This is an operation of the greateſt conſequence on moors which ſeem to conſiſt of ſcarcely any thing elſe. Lime is a provocative to the ſoil. This is all the moors want; they abound with natural fertility, but require the aſſiſtance of lime ſpeedily to render it fit for the production of new vegetables.

That theſe moory ſoils are abundantly fraught with oleaginous matter, cannot be doubted from this circumſtance. It is a common cuſtom, and has been ſo for many years, with thoſe farmers who cultivate their ſoil, to lime their land both arable and graſs EVERY year, if they can get it cheap; and this whether they dung them or not. Now, all writers agree, that perpetual liming of common ſoils will reduce them almoſt to a *caput mortuum*, unleſs a regular acceſſion of dung be alſo gained. But on moor ſoils, the benefit of theſe repeated limings are indiſputable; and the farmers from long experience aſſert, that you can ſcarcely lay on too much. Now, let me aſk thoſe gentlemen who affect to call the moors *poor land*, what they think of this fact? Is it not the ſtrongeſt proof imaginable, that the ſoil is an actual dung hill? That it is ſo fraught with fertility, you can hardly deſtroy it?

But there are ſome other general circumſtances concerning lime upon moors, which merit greater attention. There are

three

three points, which an improving landlord ſhould particularly attend to: Firſt, the exiſtence of lime-ſtone upon his eſtate: Secondly, if it is not on his own land, that it may be within a ſhort cartage of it, on roads either good, or eaſily to be made: Thirdly, that if he enjoys neither of theſe circumſtances, but is forced to draw his line from a diſtance, that the roads be good enough for the uſe of a broad wheeled waggon. If an eſtate is ſo unhappily ſituated, as to poſſeſs none of theſe advantages, then the improvement of it muſt not depend on lime, but on paring and burning alone; the efficacy of which on moory ſoils I am not acquainted with; for wherever I made my enquires, lime was always at command; nor do I apprehend, that one eſtate in a hundred is in ſuch a predicament; the ſuppoſition, therefore, is not material to the point of improvements in general.

There are ſome tracts of moors, that are ſuppoſed to be without lime ſtone; and the farmers adjoining them, bring it 5 or 6 miles; but I could never find that dilligent ſearch had been made after it: It is the opinion of the moſt unprejudiced gentlemen, that it might be found, if attentively ſought after; for theſe tracts are not extenſive, and lime to be found at a few miles diſtance all around them. This ſearch, ſhould therefore be the firſt buſineſs of an improver in ſuch a ſituation.

ARTICLE. LIII.

Of making and preſerving ground clean, by a judicious uſe of dung prepared in compoſt dung-hills; and thereby procuring good and clean crops of wheat.

[MUSEUM RUSTICUM Vol. V.]

AS you ſeem to encourage all well meaning men, who wiſh to improve our national huſbandry, permit me for once, to ſolicit a place in your work for a letter, tho'

tho' it may not, perhaps, be ſo valuable as ſome others, written by your more enlightened correſpondents.

I am, it is true, but a young man; yet have I made ſome remarks in farming, which, in my humble opinion, may prove not unuſeful to many of your readers.

It is now upwards of ſeven years, that I have been tenant of a conſiderable farm in Eſſex; but as there are ſome particular circumſtances atttending this farm, I muſt beg leave to ſay a few words on the ſubject.

The ſoil, which is, for the moſt part, a fine mellow loam, or what is in general called a good wheat ſoil, was in very good heart, and not impoveriſhed; yet the laſt tenant broke on this farm, and the landlord loſt by him near two years rent; for his crops of wheat were continually damaged by ſmut, let him take what care he would of the ſeed, and were beſides often laid and the land got very foul, tho' he was not ſparing of his fallows.

On the contrary, ſince I have occupied this land, it has born large crops of good ſound wheat, with very little ſmutty corn, and barley, oats, peaſe, beans, and other things in proportion. What will appear ſtill more ſurpriſing, is, that I do not lay on half ſo much dung as he did.

It will now, perhaps, be neceſſary to explain this ſeeming paradox. At no great diſtance from the farm lives the landlord, who is a man of fortune, and drives a ſet of horſes. This gentleman keeps no land in his own hands, ſo that he was for many years obliged to buy all the ſtraw uſed for the litter of his ſtables, which amounted to a very conſiderable quantity: However, when the laſt tenant of this farm came into it, having been a ſervant in the family, he offered to ſupply the 'ſquire with ſtraw for his ſtables, provided he might have all the dung, except what the gardener had occaſion for. The 'ſquire thought this

this a good propoſal, and the farmer imagined he had the beſt of the bargain; ſo the matter was ſoon ſettled.

Now, you are to underſtand, that the 'ſquire kept, beſides ſeven coach horſes, a ſtable of hunters, a number of road horſes, and a pack of hounds; ſo that there was made on his premiſſes, in a year, an incredible quantity of rich dung.

The farmer imagined, he was now in a fair way of making his fortune; for his father had taught him, that the man who can command dung is always ſure of large crops: But this did not prove true, in the preſent caſe.

To proceed; my predeceſſor went on plowing his land, got his fallows in good order, dreſſed them largely with dung, and always ſowed them with wheat.

His crops of this noble grain, however, by no means anſwered his expectations; his wheat conſtantly looked well and promiſing in the winter and early part of the ſpring of the year; but as it advanced it grew rank, and at harveſt was either run all to ſtraw, and was beſides very ſmutty, or elſe if a heavy ſhower of rain happened to fall, it was lodged, matted, and grew. This was indeed a very mortifying circumſtance, but our farmer could find no remedy for it. He ſeveral times, without ſucceſs, tried folding ſome ſheep on his wheat; but this part of huſbandry, for want of ſkill, he managed ſo badly, that he loſt two entire crops, for he had ſcarcely the return of his ſeed at harveſt. This could never hold long; ſo that in the end he was, as I ſaid before, broke, and ruined.

This man never could be perſuaded that any part of his loſs was to be attributed to the dung he laid on his land, though he conſtantly manured it with the horſe dung before it was half rotten, and without any mixture to allay its great heat. This kept the ſoil in a conſtant ſtate of fermentation, and ſtocked it with weeds, in ſo much, that,

when I took poſſeſſion of the farm, ſome of the ſoil was abſolutely mouldy, and ſtunk again, it was ſo rank.

I will now inform you of my methods of manage-ment, that you may be enabled to judge how far I was benefited by the errors of my predeceſſors.

I have found ſixty acres of fallow ready for ſowing with wheat: Theſe, as the land was rank, I ſowed with the win-ter-tare, which I knew, by experience, would choak the weeds and abate the rankneſs of the ſoil. In ſome parts, where the ſoil was not ſo rank, I plowed in the tares in order to ſow wheat over them; in other parts I ſuffered the tares to ſtand for a crop, which, however, was not conſi-derable, they ran ſo much to ſtraw or haulm.

When the tares were off, I got the land inſtantly in or-der, and ſowed the whole with wheat, of which I had a bet-ter and cleaner crop than had been known upon the land for upwards of ſeven years before: This all my neighbours acknowledged: However, it was neither clean enough nor conſiderable enough to ſatisfy me. Some of your readers may, perhaps, wonder what I did with my tares, as but few were ſold at the country-mark ts; but I muſt inform them, that I live within ten miles of a ſea-port town, whi-ther I ſent them at various times, in order to their being carried by ſea to London.

I am to obſerve to you, that I continued the agreement of giving the 'ſquire ſtraw for his dung; but I made an uſe of it very different from my predeceſſor.

I make it a rule, never to manure for wheat, or ſow wheat on a fallow. I do not indeed allow many fallows on my land; and when I do, I generally ſow my fallow with barley, to which I allow four or five plowings. This commonly yields me a large return, and I have a good crop of wheat after it.

This, however, is not my general method; for I am very fond of the hoeing huſbandry, to practiſe which, in ſome degree,

degree is the only infallible way of keeping land clean. To begin then with my method: I never lay dung alone on my land, let it be ever ſo rotten; but as ſoon as I get any long dung from the 'Squire's, I carry it to my compoſt-heap, where it is mixed in alternate layers or beds, with freſh virgin earth, (if I can get it) lime, or chalk, lime rubbiſh, ſcourings of ditches and ponds, turf, leaves of trees, and all the dung and offal of my family, of the hog-yard, the poultry-yard, and the dog-kennel. As to my pigeons dung, I always preſerve it to mix with ſoot, and uſe the mixture as a top-dreſſing for my wheat, whenever it happens to be too backward in the ſpring.

But to return to my compoſt: I have always ſeveral diſtinct heaps of different ages, and I ſometimes leave it three years before I uſe it, and never lay on any under two years old.

When I have got a plot of ground in order, I give it a thorough good dreſſing of this compoſt, which I immediately plow in. I then ſow it with ſome crop that requires hoeing, ſuch as horſe-beans, broad-beans, or white or gray peaſe. During the whole ſummer, I take care to keep theſe crops very clean by hoeing, eſpecially if the ſeaſon is rainy; and I am particularly cautious in preventing any of the weeds from perfecting their ſeeds.

When my hoeing-crop, which generally more than pays me all my expences, is off the land, I immediately get it into as fine tilth as I poſſibly can by repeated plowings, and then ſow it with either wheat or barley, which-ever is likely to pay me beſt; for little as ſome of your readers may think of it, barley, when it is ſown on good land well prepared, is very frequently as profitable a crop as wheat.

By thus ſowing my wheat after a hoeing-crop with dung, I have always a good return of clean corn, often five quarters on an acre; and my land will ſtill be in heart

enough to give me a reaſonable crop of oats; after which without any fallow, comes my hoeing-crop, &c.

When I ſow barley after the hoeing crop I ſuffer wheat to follow it; and then it is that, if I find it neceſſary, I give the wheat in the ſpring a top-dreſſing of ſoot mixed with pigeons dung.

I ſometimes allow only ſix pecks of wheat ſeed to an acre: This is when I ſow over it, in the ſpring of the year, 18 libs of broad clover-ſeed, which I harrow in with a pair of very light harrows; and it does not in the leaſt damage my wheat plants. I leave the clover only two years on the land; for the ſecond year, after I have mown the firſt crop for hay, I ſuffer the ſecond to grow very rank, (having given my land a ſlight dreſſing from my compoſt dung-hill the preceeding year) which I plow in, and over it ſow wheat, to be harrowed in on once plowing.

Theſe crops of wheat are ſmaller in quantity than any others I get, but the grain is finer, plumper, brighter, and heavier, generally ſelling for more at market, as being always very clean, and clear from ſeeds of weeds.

In my method of farming, ſome particulars are to be noted. In the firſt place, as my crops ſucceed one the other very quick, I am under a neceſſity of having all my ſtubble extirpated, before I give the land the firſt plowing after the crop is cut off. If it is a wheat or bean ſtubble, I generally have it all pulled up by hand by women and children; barley and oat ſtubbles, I have torn up by a pair of loaded drags, and afterwards gathered into heaps and carted to the compoſt-heap. This I do to prevent the ſtubble from being buried by the plough, and from growing mouldy in the land; from which mouldineſs I have great reaſon to think ſmut often proceeds.

Another thing to be noted is, that I allow leſs ſeed to my land than moſt of my neighbours, my quantity being from ſeven to nine pecks of wheat, from nine to twelve of

of barley, and about twelve of oats, to an acre of land; but it is always to be preſumed, that the ſeed I ſow is good. If any farmer ſhould imagine that theſe quantities are too ſmall, let him ſuppoſe every wheat plant to occupy a ſpace of ſix inches ſquare, which is ſmall enough: Let him then calculate how many ſuch ſpaces there are in a ſquare acre. When he has done this, let him proceed to count how many grains of wheat there are in a pint, which multiply by the number of pints in nine pecks, and he will find by the reſult that I, in fact, allow too much ſeed.

I intend this letter, only as a ſketch of my method of farming; and, in truth, it was chiefly written with a view of ſatisfying ſome of my neighbours who are readers of your work. Theſe farmers ſaw, that my crops were better than thoſe of my predeceſſor, yet wondered why they ſhould be ſo, for they know not the method of managing their dung to the beſt advantage; nor are they at all acquainted with the value of hoeing crops, tho' they ſee ſo many farmers in the country fond of ſowing them. Another thing puzzled them, which was, how a man could poſſibly carry on the buſineſs of a farm, without fallowing all his land once in three years.

ARTICLE LIV.

Of the growth and deſtruction of Ragweed or Ragwort.

[MUSEUM RUSTICUM Vol. LIV.]

THIS is a moſt pernicious weed, and is apt very ſoon to over-run graſs and paſture grounds, where it is neglected, and allowed to grow. Its ſeeds are winged, and are thereby blown about by the winds; and it is remarkable, that, in cow paſtures eſpecially, where the ſeeds in flying

flying are apt to be catched by the ſoft dung of the cow, it very ſoon predominates.

The botanical name is *Tacobœa*, and in England it is called *Seagrim*. It has a ſtalk in its early ſtate, green, but as it advances in age, inclining to *violet* or *purple*, eſpecially downwards. Its flowers are yellow, and thick-ſet, and compoſed each of a number of ſmall-pointed leaves. It runs to ſeed in the latter end of ſummer. The ſmell both of the ſtalk and leaves, which are jagged, (whence probably it obtains one name) and the flower itſelf, are offenſive to all animals, I think; for I have obſerved that hardly any creatures feed upon it, except almoſt hungered or ſtarved. I have not indeed obſerved whether or no aſſes reject it.

About four years ago, I obſerved the ſpreading of this weed in that part of this eſtate, which was in our own hands. I took notice that neither cows nor horſes eat it; and when I ſmelled it, I ceaſed to wonder that they did not. It was obvious to remark, that a weed ſo bulky as this, and ſo groſs, muſt extract much nouriſhment from the earth, and that it was adviſeable, to get rid of it as faſt as poſſible. The moſt eaſy method was mowing. I therefore ordered a ſervant to mow theſe weeds in the paſtures, as near to the ground as he could; and I hoped that the common mowing in the meadows would be ſufficient to deſtroy them: But I ſoon found my miſtake; for in a very few weeks, theſe offenſive ſtrangers ſhot up again into ſtalk and leaf, and even flower, tho' all in much ſmaller ſize than before, but with this diſagreeable circumſtance, that the root was ſo far from being injured with the ſcythe, that for one ſtalk ſeveral aroſe, and the root ſeemed now to have gained vigour from the wound.

I now applied myſelf to plucking up by the roots theſe odious in-mates, and found new difficulties; for while the ground was dry, as it uſually is in the latter end of ſummer,

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I found the ſtalks of ſuch of the ragweeds as were longeſt, and afforded the tighteſt graſp, either break in plucking, and leave the root in the ground entirely, or at beſt bring with it only a ſmall part of the root; and when the wet weather came on, and looſened the ground, and made it *poſſible*, or even *eaſy*, to bring away the whole ball of the root, yet the ſeaſon of ſeeding was come on alſo, and the earlieſt ripe ſeeds had diſperſed themſelves, and produced an aſſurance of a larger crop for ſucceeding years than the moſt careful plucking of the preſent crop could deſtroy.

But if theſe were the difficulties which attended my attempts to eradicate theſe *ragweeds*, which had happened not to be mowed, I was much more embaraſſed by thoſe which had been; for here it was impoſſible to get any ſuch faſt hold, as to pluck them up with *much*, or even *any* root.

I now applied myſelf to enquire what *gentlemen* or *farmers* were plagued with this weed, and what methods they had tried with ſucceſs to deſtroy it.

I was told by a gentleman in my neighbourhood, that he had been plagued with this weed, and had purſued the method of plucking with ſucceſs. Animated with this aſſurance, I reſolved to purſue this method with great attention; and as it ſeemed to be a work which required great care, both in the choice of *ſeaſon* and *manner* of plucking, I reſolved not to depute the work to others, but to endeavour to clear a ſpot in my cow paſture with my own hands, that, if my labour ſucceeded, I might employ others to follow the ſame method under my own eye, in the reſt of this paſture.

Accordingly, in the evenings of the *ſummer*, or rather *autumn*, of 1762, after ſhowers, I applied myſelf to this work; and by help of a pair of ſtrong gloves, and a tight graſp, I brought up almoſt every root, in a ſpace of about

bout 200 yards ſquare, whole; ſo that I had good hopes I ſhould ſee this ſpot clear in the ſucceeding ſummer. It is true I ſaw leaves of the ſpecies of this weed, and of a very vivid green too, around the plants which I pulled up; but as I *reaſonably concluded* theſe to be fed by the taws which ſpread themſelves from the main root, ſo I (methought *reaſonably*) *concluded* alſo, that this main root being deſtroyed, the ſide taws would die, and conſequently thoſe young leaves.

But how was I diſappointed, when in the ſummer of 1763, I ſaw this ſpot of ground as much over-run with *ragweeds*, as any part elſe of the paſture which had been unpulled!

Converſing, however, on this ſubject with a neighbour, towards the latter end of ſummer, I was aſſured by him, that, by a repetition of this labour of plucking for ſome years, he thought he had leſſened the number of his *ragweeds*, though they were ſtill numerous. Urged by this example, I have gone through the whole of my paſtures, which is about ten acres, and keeps five cows, at the latter end of laſt ſummer of 1763, with the ſame care as was uſed to a ſmall part of it in 1762; yet am I not elated with much hope of ſucceſs; for a little plot before my garden (in which my horſes run, and which was managed with ſtill more accuracy on account of the odious appearance of the ragweeds from my windows) ſeems to threaten another conſiderable crop.

As I did not confine my enquiries about the method of deſtroying this hateful weed to any one rank of men, I was told by an honeſt quaker, a farmer in my neighbourhood, that he had found turning of ſheep in winter into his cow paſture, the only effectual method of deſtroying this hateful weed.

I thought this method very likely to ſucceed; for ſheep are ſuch cloſe eaters, that I have known them deſtroy whole beds

beds of the rankeſt docks, which could not be killed by any other means.

I have not been able to try this experiment conſiderably; for, as I am raiſing quick fences, both in my meadow and paſture, I keep no ſheep. I have, however, occaſionally admitted ſome of my tenants ſheep into the ſmall plot before my garden this winter; and, upon an accurate examination this morning, I do not entertain any ſanguine hopes of great ſucceſs from this method. I find that many of the young leaves of this weed, now level with the ſurface of the ground, are untouched by the ſheep; and that ſuch others as appear bitten by them do not ſeem in a dying condition.

The truth ſeems to me, that ſheep, though they may not have the ſame averſion to this weed as horſes and cows, yet are far from being fond of it; and if any great ſucceſs is to be hoped for from their bite, (which may prepare beds for the water, and ſo decay the root) the ſheep ſhould be folded pretty cloſe upon it, and obliged to eat it near, and at ſuch a ſeaſon that the winter-rains may have time to work its deſtruction. And ſuch a method, if carefully purſued, ſeems to be moſt probable for the extirpation of this pernicious weed.

If the method of plucking is followed, I would ſubjoin ſome cautions.

Firſt, In order to prevent the large plants from ſeeding, I would adviſe to cut off all the tops, and the tops only, when the flowers begin to die, that then good hold of the ſtalk may be gotten.

Secondly, I would defer the plucking till the rains have moiſtened the ground ſufficiently to bring up the whole main root.

Thirdly, I recommend ſtriking the root ſo brought up againſt the ground, in order to diſperſe the earth which adheres to it, by way of manure.

Fourthly,

Fourthly, I always pile the plants thus pulled up and cleanſed from earth, that, if the ſeaſon prove favourable, they may be burnt, and the aſhes ariſing from them ſpread on the ground; or if this cannot be conveniently done, (though it is much the better method, and may, with a ſufficient fire, be done when they are ever ſo green) left to rot and manure the ſoil.

The groſſneſs, and even ſtench, of this weed, is a proof of the great quantity of ſalts it contains; and in the ſame proportion as any plant exhauſts the ground of its ſalts, it repays when reduced to manure. There can, however, be no queſtion, but, whilſt weeds are left to rot, a great quantity of the ſalts, which by burning would mingle with the ſoil, are carried into the air.

I have only to add, on this ſubject, that I am perſuaded *ragweed* does more harm in *meadow* than *paſture* land; for in the latter it only exhauſts the ground, on which it ſtands, to no good purpoſe; but in the former it communicates its diſagreeable ſtench in the ſweat to the good hay, and deſtroys its ſweetneſs. I adviſe, therefore, that hay makers be ordered to throw it with their rake-ſhafts out of the ſwath when ever they meet with it.

THE SCOTS FARMER,

JULY 1774.

ARTICLE. LV.

FARMERS KALENDAR.

AUGUST.

Wheat Harveſt

NOW is the time that the farmer gives the firſt of his attention to that golden crop, WHEAT. Having been a year at leaſt, perhaps a year and a half, or two years, in gaining it, he is now anxious to get it ſafe within his barn. Bad weather now greatly injures his profit; he muſt have many hands at work, to make the beſt uſe of fine ſeaſons, or he will gain the name of an *afternoon farmer*.

Reaping is a work often put out by the acre to the men, and it may be done as well ſo as moſt works; but it is neceſſary to obſerve, that they do not cut or bind in improper weather, and that they make the ſheaves no larger than proportioned to the quantity of weeds in them, and the ripeneſs of the corn. In the forming them into ſhocks or ſtacks, there is in ſome counties an art of making them in ſuch a manner, that they ſhoot off the water, and are kept tolerably dry in wet weather, without being laid ſo cloſe, as not to dry with the ſun and wind: It is a good practice, and deſerves imitation. Some farmers leave their corn ſtanding ſo long, that it is ripe enough to *cut and*

carry, as they call it; that is, they cart home the ſheave as ſoon as they are bound; But this will only do for very clean crops; for the weeds in a ſheaf are never withered enough at cutting, to carry directly.

In a farm-yard, where there are teams enough, carting the wheat crops goes off very quick with three waggons: One loading in the field, one unloading, and one upon the road, going backwards and forewards: Five horſes are ſufficient for them, and two men to load, one to drive, and two to unload; in all five: Which will make great diſpatch.

In ſome counties, it is common to ſtack all the wheat if they ſtack any thing; and they are certainly right in the practice. No rats or mice can get into a ſtack if it is built on a floor raiſed on poſts, in the common manner; and wheat, being in ſheaves, admits the cut ends of the ſtraw all to be laid outwards, ſo that the grain is defended from every injury, from all external attacks; whereas any corn that is not bound up is much damaged. Wheat is alſo found to carry a much finer countenance out of a ſtack, than a barn: The admiſſion of the air gives it a brighter colour. In getting a ſtack into the barn for thraſhing, difficulties ſometimes however ariſe; a whole one ſhould be got in at once, it being very dangerous to leave a broken ſtack expoſed all night. It muſt alſo be done in fine dry weather, which in winter the farmer may wait for in vain ſome weeks, and thereby find great inconvenience. Some of theſe evils would be remedied, and at all times a great expence ſaved, if a window was cut in the ſide or end of the barn, and the ſtack built againſt it, near enough to lay ſome ſhort planks from one to the other, and ſo do the whole by hand, throwing from the ſtack at once into the barn. Theſe are points that ſhould be well conſidered at harveſt, when the ſtacks are built.

Barley,

Barley, &c. Harveſt.

The barley crops ſhould generally have good field room lying taree, four, five, or ſix days after mowing: They will improve, and, if a heavy ſhower of rain comes, it will not diminiſh the farmer's profit: It will make the grain ſwell, and meaſure much more per acre; for maltſters reckon much on their profit in ſuch dry harveſts, that the barleys receive no rain after they are mown. But ever obſerve, that barley, oats, &c. be quite dry when you cart them; Corn is always greatly damaged from being carried in damp or moiſt; A heat is contracted in the mow, and the grain much diſcoloured, and the ſtraw ſpoiled. Both are great loſſes, and the latter not the leaſt; for barley ſtraw, well houſed, is excellent fodder, but greatly lowered in value by bad harveſting. After the fields are cleared, they are raked with an inſtrument generally called a *dew-rake*, from its being uſed in the dew of the morning: A man draws it by a broad leather ſtrap. This is a very bad contrivance. The work goes off very ſlowly, and, being hard, the men often neglect doing it well, and much corn is left in the field. Inſtead of it, there is in ſome counties a machine called a *Horſe rake*: A rake ten or twelve feet long drawn by one horſe. This machine expedites the work greatly, at the ſame time that it does it much better. The uſe of this ſhould be univerſal; for one will work againſt twenty men, as I have experienced, and the price is not above four guineas and an half complete.

Buck-Wheat.

This is a difficult crop to harveſt, for the leaſt improper treatment makes it ſhed the ſeed in the field, to the great loſs in product: If ripe, it ſhould be mown only in the dew, and left to dry in the field; and if it ſtood but a few days too long, it muſt alſo be carted in the dew,

or

or it will ſhed in carting. The grain being black, th colour of the ſample is not a matter of conſequence.

Peaſe.

All ſtrong crops of hog-peaſe muſt be hooked an not mown, and great care ſhould be taken of turning th heaps after rain; for the ſtalks and leaves are ſo ſucculen that the ſtraw will preſently ſpoil if it is neglected, and if well got in, it is good fodder for moſt ſorts of cattle. If they are ſtacked, great care muſt be taken to thatch the rick immediately, and to do it perfectly well; for a little wet getting in, will be of great damage to the peaſe.

It has been recommended in ſome books of huſbandry, to ſtack the hog-peaſe in a convenient place for fatting hogs, ready to cut down in ſlices for the ſwine as faſt as they eat them, to ſave the expence of thraſhing, but it is execrable huſbandry: The ſaving is contemptible, but the loſs great. Lean hogs in a yard will eat up peaſe clean, and in much ſtraw, leave ſcarce any; but the caſe is very different with fat ones; they will eat only the peaſe that are next their noſes, and tread half into the dung.

Beans.

Beans are always reaped and bound in ſheaves, like wheat, and being generally late in harveſt, and extremely ſucculent, they require being left a good while in the field; and for the ſame reaſon they ſhould be tied in ſmall ſheaves. In binding, there are variations: The bands are made in ſome places of wheat ſtraw; in others of yarn twine, which will laſt two years if the thraſhers are careful to ſave them: Beans do very well in a ſtack.

Harveſt-

Harveſt-Men.

The agreements with harveſt-men in various parts of the kingdom, are extremely different, and even in the ſame place there are many variations, ſome farmers purſuing one method and ſome another. A common way, in ſome parts, is to agree with the men, for all, by the acre; to reap or mow, turn, ſhock, make, cart, ſtack or barn, drive, &c. to do all the buſineſs of the harveſt, in ſhort, at ſo much *per* acre: This is a very good way; but it requires a man to be almoſt as watchful as day work: For a very ſtrict eye ſhould be had to the manner in which every thing is done; that the men do not cut your corn at improper times, that they take proper care to turn it after rain, and to get it perfectly dry into the barn. A pretty ſharp attention will be requiſite to all theſe points, and many others. On the other hand, when the work is done by the day, month, or week, it requires conſtant attention, early and late; to ſee that the men work their hours, and that upon *carrying*, in dubious weather, they work as long as they can ſee, unleſs the dews are heavy; for it is a maxim in moſt countries, that men are not to talk of *hours* in harveſt, but to do whatever they are ordered.

In many counties, it is the cuſtom to board the harveſt-men, and in ſome they are fed at an extravagant rate: I would by all means adviſe the œconomical farmer to vary this matter, if poſſible, unleſs the men really work at a great rate, and ſtick to it early and late; but, if the cuſtom is rooted ſo deeply, that they will not give it up, then it is an object of attention to make the expence as moderate as poſſible, which muſt be by a previous plan of fatting a beaſt or two, and a few ſheep for the purpoſe; and alſo by providing whatever elſe may be conſumed.

Farm-

Farm-Yard.

At the leiſure time of Harveſt, ſuch as the wet days when the team cannot carry corn, and while all the harveſt-men are employed in reaping and mowing, if the works of tillage do not require attendance, let the horſes and oxen be kept to earth-carr, to form the bottom layer in the farm-yard, carrying marle, chalk, turf, ditch-earth, or pond-mud: The quantity in proportion to that of the dung, which you expect will be raiſed in the enſuing winter. This work, it is probable, will not be compleated this month.

Turnips.

The ſecond hand-hoeing of the broad-caſt turnip crops muſt be given ſome time this month, nor ſhould it ever be omitted on account of works of harveſt. In counties where turnip-hoeing is a common buſineſs, there is no difficulty in this, as men enough are always to be had. In ſome places, many of them make it their buſineſs to hoe all harveſt through, earning more at it, than by other field work. But in countries where hoers are ſcarce, a farmer ſhould always conſider his turnip crops when he agrees with his harveſt-men, and hire a ſufficiency to ſet them to hoeing as regularly, when the turnips want it, as to reaping, when the wheat is ready.

Look well to your drilled crops: Both the horſe, and hand-hoeings, muſt be given when ever weeds ariſe, or the land ſeems to be growing adheſive.

Cabbages.

The beginning of this month, the ſecond horſe-hoeing ſhould be given to the *midſummer-planted* crop of cabbages: The earth thrown into a ridge, in the middle of each

ach interval, by the firſt, ſhould now be ſplit by the ouble mould-board plough, and thrown half to one row, nd half to the other: This earth, which has been for ome time expoſed to the weather, will be in fine order for he young fibres of roots to ſpread in; nor ſhould it be ſtir- ed by the ſucceeding operations: For the cabbage is a lant of ſuch a luxuriant growth, that the roots have power o follow the well-pulverized land thus thrown up, and the abbages will certainly be of a ſize proportioned to the uantity of food the roots command. Care ſhould alſo e taken to keep the tops of the ridges perfectly clean from eeds by the hand-hoe: None ſhould be ſuffered to grow; or on this part of the management much depends.

Sow Cabbage Seed.

This is the ſeaſon of ſowing for thoſe crops that are tranſ- planted in April or the beginning of May. Plow a piece of well fallowed land untill it is as fine as a garden; then ma- nure it amply with very rotten dung, and turning it in, har- row in the ſeed: A pound of ſeed to every four acres of the intended crop.

Potatoes.

The potatoe-crops in rows muſt be hand-weeded if ne- ceſſary; but it is now too late to hand-hoe any crops. If the intervals are weedy, or bound at all, or the plants not ſufficiently earthed up, run the cultivator through them, which will cut up weeds, and looſen the earth: After which the common ſwing-plough, or the double mould-board one, will ſtrick them clean, and throw the earth againſt the rows, banking them up: This is very neceſſary; for the running roots and fibres will follow ſuch new thrown up earth, and increaſe the crop.

Lucern

Lucern.

The drilled or tranſplanted lucern will be ready again for cutting: Attend well to the ſtate of the land, and take care to keep it in looſe well-pulverized order, and perfectly clean from weeds.

Sainfoine.

It will now be time to turn into the ſainfoine fields that were mown in June; but you ſhould be cautious of not feeding it with all ſorts of cattle undiſtinguiſhably. Sheep, if kept too long on it, bite out the heart of it by eating quite into the bulb. Cows, oxen, horſes, and young cattle, may feed on it with perfect ſafety.

Fallows.

A common fault with too many farmers is, the neglecting their wheat and barley fallows throughout the harveſt, through a miſtaken œconomy in not having hands enough to keep the teams at plough while the corn is cutting: They ſhould never be idle. It is true all work ſhould give way to carting corn that is ready for the barn; but there is no ſuch neceſſity, while it is cutting, turning, &c. works that require men alone. We often ſee the ſummer fallows over-run with thiſtles, and other weeds, by the end of harveſt, at the ſame time that the teams have ſtood ſtill three fourths of it. In defence of theſe manifeſt violations of good huſbandry, they are too apt to adopt ideas conſonant only with miſtakes of the ſame kind. For inſtance: If you enquire the reaſon of a fallow being weedy, and the ſurface bound for want of plowing, they will tell you, that land ſhould not be fine for wheat, that the crop will not do without many clods, that if it is fine, they ſhould have nothing but weeds: All which ſhews plainly, that their fallows, ſo called, are no fallows at all;

for

or fallowing land, without killing the weeds, is merely losing money without any expectation of return.

Dig-manures.

This is a work which ſhould never ſtop for hay, harveſt, or any thing elſe, if the farmer has money in his pocket and his plan is thus to improve his farm: The ſooner the work is done, the longer he has the benefit. Suppoſe he has a vein or ſtratum of marle, chalk or clay, under his farm, of light unimproved land, and that he has hired it with a view to ſuch improvement, it is very clear, that the ſooner he gets the whole done, the greater will be his profit; for the longer he will enjoy the benefit of it. In ſuch a buſineſs, teams ſhould be appropriated to the carting theſe manures alone, and never taken from the work in harveſt, ſeed, or other times; by which means, a vaſt deal of work is done in a year. Suppoſe the team to be four horſes, and two large carts: Upon an average of diſtances around the pit, theſe will carry 25 or 30 loads a day. Suppoſe the former, and that you lay 100 loads an acre, every four days you finiſh one acre, and in a year ſeventy five acres. Hence you find, that you muſt proportion the teams, ſo as to allow ſeventy five acres for each, to finiſh the whole farm in the time intended. That ought to be a year; if the work is longer doing, it is a ſtrong ſign the farmer begins it without money enough in his pocket. Suppoſe he marles a thouſand acres, he ſhould ſet thirteen teams at work: But they ſhould not be diſtinct, two carts to each, but three; one filling, one unloading, and a third moving.

Folding.

Let the ſheep-fold never ſtop in this month: The flock will bear it well, and the benefit to the land too great to be omitted. Remember the general rule of folding the land

that will be firſt ſown or turned in. You may continue t
fold the lucern lands as faſt as they are cut; and in wa
of them, thoſe for wheat.

Hogs.

This is a common month for the ſows to bring their ſ
cond litters of pigs; and, if the farmer has not had t
forecaſt to provide plenty of waſh in his hog ciſterns, h
will find the diſadvantage. Clover will not do for ſo
and pigs; they muſt be fed on the ſkim-milk, butter mil
and cheeſe-whey, that have been collecting together throu
the preceeding months, while the dairy was at its heig
Bran, pollard, barley, buck-wheat, or peaſe, ground in
meal, and ſmall quantities mixed in it,

Carrots.

About the latter end of this month, the carrot cro
ſhould be examined. It will require a ſlight hoeing, n
an expenſive one; but juſt to cut up the few weeds th
may be ſuppoſed to have ariſen ſince the laſt hoeing i
June. If the former hoeings have been well perfo.me
only a hand-weeding will do.

ARTICLE LVI.

Of the culture of the Potatoe.

[From DICKSON'S AGRICULTURE, Vol. II.]

THE potatoe is one of the moſt uſeful of all roo
In every town, and indeed in every village, there
a certain market for it. In the neighbourhood of thoſe
it ſhould be cultivated not only by the farmer, but alſo b
manufacturer

manufacturers, particularly thoſe, whoſe buſineſs obliges them to a ſedentary life. The root affords a very proper food for a family, and the culture of it, that is the planting, hoeing and taking up, afford a very proper and beneficial exerciſe. Almoſt all of theſe, it is important to obſerve, may be performed by the ſedentary manufacturer in his idle hours, and his health be much improved; ſuch a practice as this ought to be encouraged, on account of its uſefulneſs, by letting ſmall pieces of land to ſuch manufacturers for this purpoſe.

The potatoe is raiſed in a manner very different from the other roots which we commonly cultivate. In the root there are a number of what are called *eyes*, each of which is a ſeparate plant.

Some of the Engliſh writers on agriculture, recommend the ſmall potatoes for ſeed. This is improper; for the ſmall potatoes have as many eyes as the large ones, and every eye, as I have obſerved, is a ſeparate plant, and ſends forth a ſtalk and roots: When ſmall potatoes then are uſed for ſeed, a great many ſtalks come up in cluſters, and the plants ſtand ſo thick, as to deſtroy one another. The largeſt potatoes are the beſt ſeed. When cut according to the eyes and properly planted, the plants are not in danger of crowding each other, and each plant has a part of the old root to nouriſh it, till it extend its roots into the earth. From all ſides the plant ſends out roots, which extend to a conſiderable diſtance, and upon theſe roots the potatoes are formed.

There are ſeveral kinds both of white and red potatoes. Some of them, when the earth is hoed up round their ſtalks, ſend forth roots from thoſe parts of the ſtalks, that the earth is laid round; upon theſe roots, potatoes are alſo formed and nouriſhed, ſo that there may be two or three rows of potatoes from the ſame ſtem and root of different depths.

The

The ſoil moſt proper for potatoes, is a light dry ſoi
If ſuch a ſoil has but a ſmall mixture of loam, or is tol
rably rich and properly cultivated, it ſeldom fails to pr
duce a good crop, and potatoes too of a good flavour.
ſtiff and wet ſoil is improper for them; and a good cro
is not to be expected upon it, unleſs the land is laid up
ſuch a way, as to make it dry, and a conſiderable quanti
of dung is laid on to render it open.

Not many years ago, potatoes were very rare in Sco
land. A few only were cultivated by gentlemen for the
tables; and theſe were commonly planted on what are ca
led *lazy beds*. Theſe beds were generally of ſuch a length
as the break in the garden upon which they were plante
would allow, and of ſuch a breadth as a man, withou
any difficulty, could throw earth with a ſpade from on
ſide to the other. Upon the beds, after being delved, wa
commonly ſpread a little rich dung, on the top of th
dung were laid the potatoe plants, and earth from th
trenches cut betwixt the beds, was thrown upon them, ſ
as to cover them two or three inches deep. The trenche
were made wide or deep, according to the wetneſs or dry
neſs of the land.

In this manner, is wet marſhy land planted at this day
and if the trenches make the land quite dry, a tolerabl
crop may be expected; but this practice is now followe
rather to improve the land, than from the expectation o
procuring a good crop of potatoes. The laying the land
up in theſe beds, if there is a proper deſcent, frees it from
the water, and gives the ſoil a degree of firmneſs, ſo that
a plough can go upon it next ſeaſon; if any conſiderable
ſprings diſcover themſelves in the trenches, the water may
be carried off by covered drains, and the land thereby kept
dry for the future. Sometimes there is no need, for ei-
ther dunging or delving the beds; the potatoe plants are
laid upon the turf, and covered with earth from the

trenches.

trenches. This is done at ſmall expence, as the potatoes ſeldom fail on ſuch land to produce large ſtalks; by theſe the ſurface is covered, the graſs is prevented from growing, and the ſoil tolerably reduced.

When the crop of potatoes is chiefly in view, they are not planted in this manner; they are planted in a manner leſs expenſive, and more beneficial. It is of importance to give the land intended for potatoes, a plowing before winter, unleſs it is in its nature very open and free: If the land requires dung, the proper ſeaſon for laying it on is before this plowing. It is not neceſſary that the dung be well rotted; though it be rough it will anſwer equally well. When the potatoes are to be planted, which may be done any time in the month of March, or beginning of April, the land muſt be plowed again in narrow furrows, and the potatoe plants dropped into every ſecond furrow. If the land is open and very looſe, it may be plowed in wide furrows, and the potatoe plants dropped into every furrow. The plough as it opens the furrow for the ſecond row of potatoes, buries the firſt row at a proper depth. The furrow ſhould not be made very deep, and for this reaſon, two horſes are ſufficient for the plough. It is better in this caſe, to make them go-a breaſt, than in a line in the ordinary way. By going a-breaſt, one of them only goes in the furrow, and thereby, leſs hurt is done to the potatoe plants, and fewer of them put out of their places. If the horſes could be made to go both upon the the firm land, the yoking them in a line would in this caſe be better.

The planting the potatoe in this manner after the plough, is much better, than the manner of doing it by a planting ſtick, called by us in Scotland, a *Dibble*. This method of planting by the dibble, is by far more tedious, and it has this very particular diſadvantage, that the land is preſſed down, and firmed by the planter treading upon it.

Whereas

Whereas, in the way of planting by the plough, the earth round the plant is quite looſe, and the land left in the openeſt ſituation poſſible; this is of advantage to the growing of the plants, and there is no danger from drought, as the ſeaſon of planting is early, and the plants laid deep.

When ſmall quantities of potatoes are cultivated by manufacturers, they may plant them with the ſpade, in the ſame manner that the farmer plants them with the plough. They may open with a ſpade, a furrow or ſmall trench, at the end of the ridge acroſs; into this furrow they may drop the potatoe plants at their proper diſtances, and in making the next furrow for this purpoſe at the proper diſtance they cover the plants ſet in the firſt made furrow, as is done by the plough.

According to the diſtance of the rows made by the plough, the diſtance of the plants in the rows ſhould be regulated; one plant in a foot ſquare is enough, to allow the plants to be properly hoed. When the plants are ſet in every ſecond furrow plowed narrow, the rows will be about 12 or 14 inches aſunder. The plants may be placed at the ſame diſtance in the rows: Or they may be placed nearer in the rows, and the rows at a greater diſtance, which is done by making the plough take off more by making the furrows. When the plants are thin ſet, and placed at equal diſtances, the earth on all ſides is hoed up to the plants; but when they are ſet thick in the rows, and the rows at a diſtance, then the earth is hoed up only to the rows, and the weeds betwixt the plants taken out. The Engliſh writers on huſbandry, that direct the uſing ſmall uncut potatoes for ſeed, direct alſo, that trenches be made at the diſtance of one foot from each other, and the potatoes laid in theſe trenches at ſix inches diſtance. No perſon accuſtomed to raiſe crops of potatoes, would have given ſuch directions. If we ſuppoſe, that three or four ſtalks come up from every potatoe, that theſe cluſters are only

ſix

ſix inches diſtant from the cluſters in the ſame row, and twelve inches diſtant from the cluſters in the contiguous rows, it muſt appear, that the ſurface will be ſo much covered, as to prevent the air from having acceſs to the roots, which it is certain from experience, is a very great loſs to the crop.

It is not neceſſary to harrow the land, after the potatoes are planted: It may be allowed to remain in the ſituation in which it is left by the plough, till a crop of weeds appear, and then it may be harrowed to deſtroy theſe weeds.

Though the potatoes are planted early in the ſpring, or even before winter, yet they do not come up till the month of May: Before that time the weeds are far advanced: and if they are not deſtroyed by the harrows, the land muſt be hoed. The deſtroying the weeds at that ſeaſon, is of great advantage to the crop, and the operation may be performed without any danger to the young plants; for though ſome of them may be ſo far advanced, as to be cut by the hoe, yet this does but little harm, as they ſpring again from the ſtalk, below where cut. The goodneſs of the crop depends much upon the preventing the weeds from coming to any height; and for this purpoſe, the potatoes muſt be frequently and carefully hoed. If this operation is neglected, there is no reaſon to expect a good crop, for there is no crop more damaged by weeds than potatoes, and therefore there is not one that requires more frequent hoeings. If the rows are ſet wide, a kind of breaſt-hoe may be uſed to throw a little earth on each ſide, by which it is raiſed a little about the plants. This would make the work more expeditiouſly done than by the common hoe. The kind of hoe called the Dutch hoe, is uſed in this manner; but it does not throw the earth to a ſide, but has an opening in the middle, for letting the earth raiſed with the weeds paſs through.

Though large potatoes ſhould be uſed for ſeed, and though

though great care ſhould be taken in cutting them, yet ſometimes there will be two or three plants in one peice: When this happens, or when the ſtalks are in danger of covering the ſurface too much, as is commonly the caſe in light wet land, then the plants ſhould be cleaned with the hand at the root, and only one ſtalk left to each plant. This not only gives air to the roots, but alſo prevents much of the nouriſhment from going into the ſtalks,

Potatoes ſucceed very well in the horſe-hoeing huſbandry: The plowing of the alleys allow the bearing roots to puſh themſelves more eaſily to a diſtance from the plants, by which the crop is greatly increaſed.

When it is propoſed to have a field of potatoes to be horſe-hoed, it may be plowed in beds, or ridges of the breadth intended to be hoed, either in the winter or in the ſpring. The greater difficulty that there is in managing the ſoil, the ridges ſhould be made the wider, that ſo the alleys may be the better plowed.

When the potatoes are to be planted, a furrow muſt be drawn along the crown of every ridge. In the bottom of this furrow, a little rough dung may be laid, and the potatoe plants dropped above the dung, and covered by the plough going once along each ridge; this is all that is neceſſary in planting.

When the potatoes begin to appear above ground, the alleys muſt be plowed, turning the earth to the rows, and going ſo near, as to cover the plants. When the plants appear again, the rows muſt be carefully cleaned with the hand-hoe, and the alleys plowed, turning the earth from the rows, into the middle of the alley. In that ſituation the field may remain, till the roots of the potatoes are every where breaking out in the open furrows, on each ſide of the rows; then the alleys may be plowed a third time, turning the earth to the rows, and if any weeds at this time appear in the rows, they muſt be pulled out.

Hoeings

Hoeings after this are unneceſſary for deſtroying the weeds, and improper, leſt the young potatoes ſhould be hurt.

When the huſk that contain the ſeed, or the apple, as it is commonly called, is compleatly formed, the ſtalks may be cut down, and given to cows; the ſame uſe may be made of the ſupernumerary ſtalks pulled up, which may poſſibly ballance the expence of pulling and gathering. Milk cows have been tried with this food; they eat it very well, and it gives no bad flavour to their milk; perhaps it may not be proper to give them this food only, but they may have a conſiderable quantity of it once or twice a day without any danger.

The time of taking up potatoes depends upon the market. If nothing is in view but the largeneſs of the crop, they ought to ſtand till October, or rather as long as is convenient to have them taken up before the froſt ſets in, or the land becomes wet.

As the moſt expeditious way of planting potatoes is by the plough, ſo the moſt expeditious way of taking them up is likewiſe by the plough. Eight or nine perſons attending the plough is ſufficient for this purpoſe. After the field is once plowed, it ought to be harrowed, by which ſome potatoes will appear above ground, and when theſe are gathered, it ſhould be plowed a ſecond time. After all, ſome will be left, but theſe are either deſtroyed by the froſt in winter, or when the land is plowed in the ſpring.

ARTICLE LVII.

SYSTEM *of* FARMING *ſucceſsfully practiſed for ſeveral years,*

By the late EARL of BALCARRAS

ALL improvers, in order to ſucceed, muſt be well furniſhed with money; and are not to be ſparing of it upon all neceſſary occaſions.

An able and honeſt overſeer muſt be found; and he muſt have ſturdy able ſervants, ready to obey directions, which he had beſt be capable of giving himſelf.

The beſt inſtruments of all kinds muſt be had; carts and wains with iron axletrees, ploughs, ſtronger and lighter, for the firſt and following plowings. Beſides the common harrows, he ſhould have harrows of five foot and a half ſquare with five bars, and the teeth three inches longer than the common ones: Theſe are called Break-harrows; and are drawn by two good horſes: A triangular harrow is alſo needful: This ſhould be made of ſtrong wood; the baſe five foot and a half broad, and another bar a foot and a half before it, with a bar near the point; theſe muſt contain twenty four ſtrong teeth. This is drawn by four oxen and two horſes, and ſerves to break the ground after the ſecond plowing when the ground is under fallow and is of excellent uſe, as it makes the ſubſequent plowings with the light ploughs go eaſily forward. A roller alſo muſt be had: This ſhould be five foot and a half broad, made of aſh or elm, fifteen inches diameter, with three rows of ſpakes fixed in it, as if for wheels, one in the middle, and one near each end: It ſhould be covered with planks of plane-tree, two inches thick; a box ſhould be placed upon the top for the rider to ſit upon; and it is to be drawn by two good horſes. It ſhould be furniſhed with three ſhafts, to place the horſes a-breaſt; otherways the inſtrument will not turn without too much contuſion upon

pon the ground. This inſtrument will roll near ſix cres in one day; and a long experience ſatisfies me, that ll crops are the better for it. Another ſet of harrows are lſo neceſſary for harrowing graſs and turnip ſeeds: Theſe hould be made very light, and ſix feet ſquare, with ſix ars to contain teeth ſuch as thoſe of a garden-rake, and s cloſe ſet together.

Horſes and oxen muſt be procured, ſtronger than thoſe ſed by the generality of our farmers, which have not ſtrength for tilling deep enough for fallowing, or for the firſt lowings of the wheat grounds after harveſt, that are deſigned for turnips in the ſpring. All my other plowings for grain are ſeldom more than four inches deep.

The half of my ploughs are drawn by four of the beſt oxen and two horſes, the other half by three, ſometimes four horſes.

My farms conſiſt of 650 acres, which paid L. 300 a year. Of theſe, 40 acres are in garden ground and plantations round my houſe; 24 acres are occupied by an avenue to it; 396 acres are in graſs; and 190 in tillage: the whole near inclоſed; the one half with ſtone and lime-walls, the other by double ditches faced with ſtone, and planted between. Twelve incloſures next my houſe, of ten acres each, are always, three of them in wheat, three in turnips, three in barley, with which I ſow twenty pounds of red clover per acre for the following crop; and the remaining three acres are kept in fallow, as a preparation for wheat.

Fallowing was little practiſed in Fife, till I began it; and the method I follow is this: As the ſoil was foul and full of weeds, I ſeldom gave it leſs than ſix plowings; the firſt always immediately after harveſt; the ground was then croſs-plowed, and well harrowed with the break-harrow. The triangle went then over the whole, which made the after-plowings with light ploughs eaſy: After the laſt

plowing,

plowing, I laid on about thirty bolls of ſlaked lime on each acre in little heaps, and had the ſame ſpread by hand; and the ground was then harrowed with the common harrows. In September or October, the wheat was ſown and covered with a light furrow, ſo to remain till the ſpring when it was carefully rolled, ſo ſoon as the ground was ſufficiently dry. The ridges ought never to be above ſeven feet broad, and gathered up the laſt plowing with a good water-furrow.

The next crop is turnips, ſown with about one pound to the acre: The half of my fields are ſown with the green and red-topt, the other with the Hertfordſhire turnip, which continues longer good than any other. After the harveſt is got in, I plow the wheat fields; and as ſoon as the ground is dry, I croſs-plow and harrow with the break-harrow: If the ground is rough and cloddy, I roll it, then plow and harrow it: If it is ſtill cloddy, I roll and plow again; for the ſoil muſt be thoroughly pulverized: the ſeed furrows muſt be plowed deep, as deep as the ſoil is good, and as ſtraight as poſſible, and at the diſtance of three feet from each other. The dung muſt be laid in ſmall heaps, out of the carts, near the furrows, and ſpread equally by the men in the furrows. About half the quantity of dung that is uſually laid upon corn fields will ſuffice. About the middle of June the whole field muſt be tilled and the dung covered, and well harrowed: If the ground is dry, you muſt wait for rain; then the turnips are to be ſown by the drill-plough; the Hertfordſhire turnip ought to be the laſt ſown. As ſoon as the rows of turnips are two or three inches ſprung, they muſt be carefully hoed about nine inches from each other; and the plants that are to ſtand muſt be weeded and left ſingle as much as poſſible. Then a light plough with two horſes, or one, muſt be employed to throw the ground about three inches from each ſide of the rows, ſo to remain

main for eight or ten days; then the ground to be returned as near the plants as they can without covering them: If the ground is weedy, this muſt be performed a ſecond time. About half an acre of theſe turnips, if good, is more than ſufficient to fatten a good ox. In feeding with turnips, the cattle ought to have half a ſtone of clover-hay each to ſupper them: The byres muſt be well cleaned twice a day, and the floor they lye upon made of ſmooth ſtones. I buy my oxen from Auguſt to October, put them upon my hay ſtubble or graſs fields that are half eaten, till I put them up for the turnips. Thoſe I buy from L. 6 to L. 8 price I find to anſwer beſt; and I commonly ſell about ſeventy or eighty of them in March or April for about L. 4 of profit each.

The next crop is barley. As ſoon as a turnip field is eaten, and the ground ſufficiently dry, I plow it up as ſoon as other labour will permit, and bring four ridges into one. I plow again, and harrow well, but never plow for barley above four inches deep: A third plowing is commonly needful; after which I ſow and harrow, and then ſow twenty pounds of red clover to each acre above it, and harrow it in well with the graſs-ſeed harrow.

Here I muſt obſerve, that where fields are to be ſown with graſs-ſeeds for paſture only, the beſt method is to ſow them without corn. Let the ground be tilled after harveſt; give it a croſs plowing in the ſpring; harrow it, and lay on about thirty bolls of lime on each acre, and harrow it in: about the end of June I plow with the light plough fur; harrow and ſow twenty pounds of white clover upon each acre: It muſt be well rolled; and muſt not be fed but in dry weather for the firſt year: This method will give a ſtool of graſs, which would not be ſo good for many years, if ſown along with corn.

The next crop is the red clover, neceſſary for feeding the turnip cattle. About the middle of June I cut it:

As

As ſoon as the hay is made and removed, I till the ground for wheat, thereafter give it a croſs plowing, then I put the triangular harrow on it; and ſow the wheat in September under furrow; and roll it in the ſpring. When my ground comes to be in heart and good order, I often ſow my wheat above furrow; which I find to be the beſt method after but once tilling the clover ground; and with but a light furrow, and it proves very well. I uſed to lime my wheat field every fourth year; but it made the crop often too tall, and apt to be laid down by winds and rain. I therefore found it better, to lime the turnip or barley fields every fourth year; and as the ſoil improves by this year's ſyſtem, ſo I now lime the ſeldomer.

The other parts of my fields or farms, where I have no turnips, is differently managed. I plow and fallow as for wheat; upon the laſt plowing but one, I roll, and lay thirty bolls of ſlaked lime upon the acre in ſmall heaps, which is ſpread equally: and the ridges are then gathered up with a light furrow to lye the winter. In the ſpring I ſow barley on the winter-furrow, without tilling; as the winter froſt and rain will have made ſome inches of the ground quite fine, I then harrow well with the break-harrow, and roll, which I find a very good practice.

The next crop is oats, neceſſary for the ſake of the ſtraw to feed the cattle; otherways I would chuſe to have no oats.

The next crop is peaſe and beans, for which I give the ground a good furrow, and harrow well. I plow again with a lighter furrow, and drop in the ſeed by hand, intermitting every ſecond furrow: Cover and roll well.

The next crop is wheat, and again fallow for barley as before.

By the conſtant practice of this ſyſtem now for twelve years paſt, I have ſeldom done leſs, after all expences defrayed, than doubled the old rent; and ſeveral years much more.

ARTI-

ARTICLE LVIII.

On the CULTURE *of* COLESEED,

By ARTHUR YOUNG Eſq;

Publiſhed by deſire of the SOCIETY, for the encouragement of Arts, Manufactures and Commerce.

Experiments on Coleſeed.

THE trials I have made on this branch of culture, are not of that extent I could wiſh; but as they are accurate, and minutely regiſtered, it is apprehended they may be of uſe to others who are inclined to attempt larger undertakings. With this view the following experiments are ventured to the eye of the Society: it is hoped they will excuſe confined views, and a want (perhaps) of thoſe *reflections* and *obſervations*, which modern writers of huſbandry are famous for. The only object I ever had in matters of agriculture, is *experiment*. I inſert ſome of my trials on this vegetable, but ſhall not trouble the Society with many remarks; they muſt make their own way, for I am not one of thoſe who write ten obſervatory pages to one experimental period.

EXPERIMENT, No I.

Culture, Expences, and Produce of half an Acre of Coleſeed, in two Diviſions, 1765.

COLESEED, wherever I have remarked the cultivation, has been ſown for a crop of ſeed, as well as food of cattle, but often fed off with ſheep, and afterwards reaped for the ſeed. It is uſually ſown in the manner of turnips; but I never knew any hoed even by thoſe farmers that are niceſt with the latter crop. It was this circumſtance that firſt induced me to cultivate coleſeed; to diſcover

diſcover if I could gain better crops than common (fo
ſheep) by means of a better than common culture.

The ſoil of this experiment is a looſe woodcock brick
earth, and under that a white clay, the field hangs a litt
to the north.

Culture.

The land received the firſt tillage in Autumn 1764. I
March 1765 plowed it again. In April again, and twice har
rowed it The ſecond week in May it had its fourth earth
and was again harrowed. The beginning of June anothe
plowing: and on the 23d it was all ſown, after a freſh plow
ing, and harrowed in; the quantity of ſeed a pint and
half. The extreme dryneſs of the ſeaſon, which deſtroye
almoſt all the turnips in the country, rendered this cro
much worſe than it would otherwiſe have been: th
ſeed aroſe but indifferently and irregularly, in ſom
perches many plants, and in others but few: reſpectin
the grand diviſion into two equal parts, this irregularit
was not great. The laſt week in July one half was hand
hoed in the manner of turnips, and the other half le
as managed by the common farmers, that is, had nothin
done to it. The hoes were ſmaller than turnip ones. Au
guſt the 4th, this operation was repeated. The effe
was very viſible in the ſuperior luxuriance of the crop.

It was left until February, the middle of which month
the diviſions were herdled; and forty ſheep turned int
the commonly cultivated half. It laſted them exactly fiv
days. They were then turned into the other rood, whic
laſted them five days. The field was then plowed up.

Account of the common rood.

Expences.	*l.*	*s.*	*d.*
Six plowings at 1 *s.* (the labour)	0	1	6
Four harrowings	0	0	1½
Seed	0	0	4
Sowing	0	0	0½
Carry over	0	2	0½

	l.	s.	d.
Brought forward	0	2	0¼
Rent, tythe, and town-charges	0	4	3
	0	6	3¼

Produce.

	l.	s.	d.
Keeping 40 ſheep 2 days at 4 *d* per week per ſheep	0	3	4
Expences	0	6	3¼
Produce	0	3	4
Loſs, 11 *s.* 9 *d.* per acre	0	2	11¼
The expences of my horſes, and wear and tear, this year, divided among all the work performed, is, for plowing, 2 *s.* 4½ *d.* per acre per earth: ſix at this rate are	0	3	7
The expences of harrowing four times, at 4½	0	0	4½
	0	3	11½
Total loſs, 1 *l.* 7 *s.* 7 *d.* per acre	0	6	10¾

Account of the hoed rood.

Expences.

	l.	s.	d.
Six plowings	0	1	6
Four harrowings	0	0	1½
Seed	0	0	4
Sowing	0	0	0¾
Two hand-hoeings at 7 *s.* per acre	0	3	6
	0	5	6¼
Rent, &c.	0	4	3
	0	9	9¼

Produce.

	l.	s.	d.
Keeping 40 ſheep 5 days, at 4 *d.* as before	0	9	2
Expences	0	9	9¼
Produce	0	9	2
Loſs, 2 *s.* 5 *d.* per acre	0	0	7½
Plowing and harrowing as	0	3	11½
Total loſs, 18 *s.* 3 *d.* per acre	0	4	6½

OBSERVATIONS.

This trial is no great encouragement to cultivate coleſeed, but the year was very unfavourable, and had it been otherwiſe, determinate concluſions ought never to be the conſequence of ſingle, or a few experiments. Repeated trials, in various ſeaſons, and many ſoils, alone authoriſe abſolute deciſions.

The reaſon I plowed up this crop, was my intention of not letting it ſtand for ſeed; had that been the deſign, it muſt not have been fed much later; and as I made this trial to diſcover profit of feeding coleſeed, that is, for ſeed, I thought it neceſſary not to let it ſtand longer. I ſhould remark, that a ſecond feeding, in time for barley or oat ſowing, I know from obſervation to be a mere nothing.

Compariſon.

	l.	s.	d.
Loſs by the unhoed	1	7	7
——————hoed	0	18	3
Superiority per acre of the latter	0	9	4

This proves ſufficiently the great benefit of the practice, beſides the cleaning the land, which is yet more. But I ſhould

ſhould remark, that the hoeing, if it was a general practice, would be done much cheaper. Labourers always impoſe, when their work is uncommon.

EXPERIMENT, No II.

Culture, expences and produce of four acres, 1765.

This field hangs to the north, and the ſoil is a ſtrong clay.

Culture.

The laſt crop was oats, the ſtubble of which was plowed in October 1764, and the field well water-furrowed. In April 1765, it received the firſt Spring-plowing. In May was ſtirred twice more, and harrowed once. June 19th, plowed it again; July 1ſt again, and harrowed in the ſeed. The field was then well water-furrowed.

The exceſſive drought prevented the crop from riſing as it ought to have done, but yet the plants were more numerous than in ſome turnip fields adjoining. I was induced therefore, as the land had been well prepared, to let it ſtand.

January 24th, I turned into it fifty ſheep, and three two-year-old heifers; it kept them juſt three weeks.

Expences.

	l.	*s.*	*d.*
Six plowings	1	4	0
Two harrowings	0	1	0
Two water-furrowings	0	8	0
Seed	0	1	4
Sowing	0	1	0
	1	15	4
Rent, &c.	3	8	0
	5	3	4

Produce.

Produce.

	l.	s.	d.
Keeping fifty ſheep three weeks at 4 *d.*	2	10	0
Ditto three young cattle at 1 *s.* 3 *d.*	0	11	3
	3	1	3
Expences	5	3	4
Produce	3	1	3
	2	2	1

	l.	s.	d.
Plowing at 2 *s.* 4¾*d.*	2	17	6
Harrowing at 4½*d.*	0	3	0
	3	0	6
Loſs, 1 *l.* 5 *s.* 7¾*d.* per acre	5	2	7

OBSERVATIONS.

The greatneſs of this loſs is certainly much owing to the dryneſs of the ſeaſon. But ſuch miſchances are never to occaſion a neglect of trials that are ſubject to them: all vegetables are liable to ſuch evils, and if one ſpecies withſtands the enemy better, upon the average of a long period than another, it is an advantage which ought by no means to be overlooked. Experiments, regiſtered only in favourable years, are uſeleſs, becauſe unfair.

The ſheep and young cattle, both affected this food much; but the latter not ſo ſoon as the ſheep.

EXPERIMENT, No III.

Culture, expences, and produce, of half an acre, in two diviſions, 1766.

The ſoil the ſame as in the laſt experiment; and alſo the expoſure. *Culture.*

Culture.

In October 1765, the firſt plowing was given; in March 66, the ſecond; in April and May two more. The firſt eek in June harrowed it; again in the ſecond; plowed it en for the fifth time, and ſowed it, and harrowed in the ed. The plants roſe extremely favourable. The 9th of July and-hoed one rood for the firſt time; and again the 24th. he effect of theſe hoeings was ſtriking.

September 9th, viewed this experiment; the hoed part as thick as the other, and much more luxuriant, but ry few weeds, the other full of them.

March the 17th, hurdled the diviſions, and fed them off ith ſixty ſheep. The unhoed half laſted them ſix days. hey were then turned into the other, which kept them ſt eight days. N. *B.* They were taken out of nights, and dged in a ſmall paſture near the field.

Account of the rood commonly managed.

Expences.

	l.	*s.*	*d.*
Five plowings	0	1	3
Three harrowings	0	0	1¼
Seed	0	0	5
Sowing	0	0	0¾
	0	1	10
Rent, &c.	0	4	3
	0	6	1

Produce.

Keeping 60 ſheep ſix days at 4*d.*	0	16	10½
Expences	0	6	1
	0	10	9½

Plowing,

	l.	s.	d.	l.	s.	d.
Plowing, at 2s. 5¼l.	0	3	0½			
Harrowing, at 4½d.	0	0	3¼			
				0	3	3¾
Profit, 1l. 9s. 11d. per acre				0	7	5¼

Account of the hoed rood.

Expences.

As before	0	1	10
Two hand-hoeings at 7 s. and 6 s.	0	3	3
Rent, &c.	0	4	3
	0	9	4

Produce.

Keeping 60 sheep eight days at 4 d. per week	1	2	6
Expences	0	9	4
	0	13	2
Plowing and harrowing as before	0	3	3¾
Profit, 1l. 19s. 5d. per acre	0	9	10¼

COMPARISON.

	l.	s.	d.
Profit by the hoed	1	19	5
Ditto by the unhoed	1	9	11
Superiority of the former per acre	0	9	6

OBSERVATIONS.

These crops are both profitable, but the hoeing is evidently the superior method in the crop itself, as well as in the benefit the land receives.

The sheep are very fond of this crop, which agrees perfectly well with them, and the young lambs throve very much

ntich. I propoſed keeping it longer, but wanted the land for barley, which ſhould never be delayed on any account.

A circumſtance happened relative to theſe crops, which is worth attention: An old ſow found her way to them before they were fed off, and viſited them every day, feeding very heartily, and coming regularly home at night; I let her alone, to obſerve the effect, which ſhewed the food to be very wholeſome and feeding; for ſhe throve well and neglected her other food: this hint purſued further in another experiment.

EXPERIMENT, No IV.

Culture, expences, and produce of half an acre, in four diviſions, 1766.

This piece is in the ſame field as the laſt experiment. The ſoil and expoſure the ſame.

Culture.

The firſt plowing was given in Autumn 1765. In March 1766, plowed the next time. In April plowed and harrowed; in May plowed and harrowed. The firſt week in June ſtirred it again; the 27th again; and ſtruck it by this plowing into four parts.

No 1. Harrowed in the ſeed broad-caſt, for the common management.

No 2. Harrowed in the ſeed broad-caſt, deſigned for hand-hoeing.

3. Thrown on to five feet ridges, and drilled a double row one foot aſunder each.

4. Left flat, and drilled in equally diſtant rows two feet aſunder.

July

July 15th, hand-hoed, No 2, 3, 4. The 21ſt, hor
hoed No 3. by throwing a furrow *from* the plants. T
23d, hand-hoed it again, ſetting the plants out eighte
inches from each other in the rows. Auguſt 6th, han
hoed No 2, 3, and 4. The 12th, horſe-hoed No 3. agai
throwing the mould to the plants. The 22d, anoth
horſe-hoeing, reverſing the laſt. September 2d, anotne
throwing the earth back to the plants.

The end of March, I mowed No 1. firſt, and ſpread t
crop upon a piece of dry graſs land; I then, in purſuan
of the Item I had in the laſt experiment, turned fifte
hogs about three parts grown into the field: they took
once to the coleſeed, and fed very heartily upon it. Th
were kept to it, and it laſted them juſt three days.

No 2. Laſted them ſeven days.
3. two days.
4. five days

The hogs throve very well on this food, and none
it was waſted.

Account of No I.

Expences.

	l.	*s.*	*d.*
Six plowings	0	0	9
Three harrowings	0	0	0½
Seed	0	0	3
Sowing	0	0	0½
Mowing, carting, and ſpreading	0	0	5
	0	1	6½
Rent, &c.	0	2	1½
	0	3	7½

Produce

Produce.

	l.	s.	d.
Keeping 15 hogs three days at 3*d.* per hog per week	0	1	6¾
Expences	0	3	7¾
Produce	0	1	6¾
	0	2	1
Plowing, at 2*s.* 5¼*d.*	0	1	9¾
Harrowing, at 4½*d.*	0	0	1½
Carting, at 6½*d.*	0	0	0¾
	0	2	0
Loſs, 1*l.* 12*s.* 8*d.* per acre,	0	4	1

Account of No II.

Expences.

	l.	s.	d.
As before	0	1	6¼
Two hand hoeings at 5*s.* and 5*s.* 9*d.*	0	1	4
	0	2	10¼
Rent	0	2	1½
	0	4	11¾

Produce

Keeping 15 hogs 7 days	0	3	9
Expences	0	4	11¾
Produce	0	3	9
	0	1	2¾
Plowing, &c. as before	0	2	0
Loſs, 1*l.* 5*s.* 10*d.* per acre	0	3	2¾

Account of No III.

Expences.

	l.	s.	d.
Six plowings	0	0	9
Three harrowings	0	0	0¾
Carry over	0	0	9¾

	l.	s.	d.
Brought forward,	0	0	9¼
Seed	0	0	1
Drilling, at 3¼d.	0	0	0½
Three hand-hoeings at 3s. 6d. 3s. and 2s. 6d.	0	1	1½
Four horse-hoeings at 8d.	0	0	4
Mowing, carting, &c.	0	0	4
	0	2	8¼
Rent	0	2	1½
	0	4	10¼

Produce.

	l.	s.	d.
Keeping 15 hogs 2 days	0	0	11½
Expences	0	4	10½
Produce	0	0	11¼
	0	3	11

	l.	s.	d.
Plowing	0	1	9¾
Harrowing	0	0	1½
Drilling, at 3d.	0	0	0½
Horse-hoeing, at 1s.	0	0	6
Carting	0	0	0¾
	0	2	6½
Loss, 2l. 11s. 8d. per acre	0	6	5½

Account of No IV.

Expences.

	l.	s.	d.
Six plowings	0	0	9
Three harrowings	0	0	0½
Seed	0	0	2
Drilling, at 4½d.	0	0	0½
Two hand-hoeings, at 4s. 9d. and 5s. 3d.	0	1	3
Mowing, carting, &c.	0	0	5
	0	2	8½
Rent	0	2	1½
	0	4	9½

Produce

Produce

				l.	*s.*	*d.*
Keeping 15 hogs 5 days				0	2	6
Expences				0	4	9¾
Produce				0	2	6
				0	2	3¾
Plowing, harrowing, and carting, as in No 1.	0	2	0			
Drilling, at 3¾*d.*	0	0	0½			
				0	2	0½
Loſs, 1*l.* 14*s.* 2*d.* per acre				0	4	4¼

RECAPITULATION.

	l.	*s.*	*d.*
No 1. Broad-caſt unhoed, loſs per acre	1	12	8
2. Ditto, but hoed ditto	1	5	10
3. Horſe-hoed ditto	2	11	8
4. Drilled in equally diſtant rows, ditto	1	14	2

From this view the comparative advantages (or rather diſadvantages) of theſe methods are pretty clearly ſeen.

OBSERVATIONS.

The ill ſucceſs of this experiment is to be attributed to more cauſes than one; the poverty of the crops in point of quantity, and the vegetable not being of that ſubſtantial nature which goes far in the feeding of the cattle: and yet I think 3*d.* a-week a fair price for hogs that riſe when full grown to about ten ſtone (14 *lb.*) From viewing the field, I ſhould have thought the hoed broad-caſt crop would have turned out better; but it never carried near ſo good an appearance as Experiment No III. But whatever idea is formed of Coleſeed in general from this trial, the comparative part of it is very deciſive: drilling is evidently an improper method to cultivate it; and horſe-hoeing

ing exceſſively unprofitable, the expences being very great and for worſe than no purpoſe. The beauty and luxuriance of the plants in theſe rows were great, but the ſuperior quantity of the others much more than ballanced this circumſtance.

EXPERIMENT, No V.

Culture, expences, and produce of half an acre, in three diviſions, 1767.

The ſoil, expoſure, &c. the ſame as in the preceeding experiment.

Culture.

This piece received its firſt tillage in October 1766. In November it was ſtirred again. The third earth was given in March; the fourth the beginning of April; the fifth, the latter end of the ſame month, when it was harrowed. The 6th of May plowed it and harrowed it again. Harrowed it again on the 16th. The 28th plowed it again, ſtriking it into three parts, and harrowed all. The 29th ſowed No 1. with coleſeed broad-caſt. No 2. with turnips broad-caſt.——No 3. was planted with cabbages, the Batterſea ſort, in rows four feet aſunder, and three feet in the rows, the plants of which had been raiſed in the garden.

June 15th, all three were hand-hoed. The 27th, horſe-hoed the cabbages, and hand-hoed the turnips and coleſeed again. July 18th, the ſecond horſe-hoeing. The 28th, the third. Auguſt 4th, hand-hoed them again. Auguſt 6th, the fourth horſe-hoeing. All three crops flouriſhed exceedingly. October 5th, cut them all, and weighed the produce.

		tons.	*cwt.*	*lb.*
No 1.	weighed 17 *cwt.* or per acre	5	0	0
2.	3 ton 18 cwt.	21	18	0
3.	4 13	27	18	0

They

They were then given, upon a bare graſs field, to two large oxen, and two dry cows.

	l.	s.	d.
No 1. Laſted them two days, which, at 5s. a-week for the two oxen, and 3s. 6d for the two cows, comes to 2s. 6d. or, per acre,	0	15	0
No 2. Laſted them a week, which, at the above prices, comes to 8s. 6d. or, per acre,	2	11	0
No 3. Laſted them juſt a week and half, which, at the above prices, comes to 1l. 1s. 3d. or, per acre	6	7	6

Account of No I.

Expences.	l.	s.	d.
Seven plowings	0	1	2
Four harrowings	0	0	1
Seed	0	0	2
Sowing	0	0	0½
Two hand-hoeings at 6s. and 5s. per acre	0	1	10
Mowing, carting, and ſpreading	0	0	6
Expences	0	3	9½
Rent, &c.	0	2	10
	0	6	7½

Produce.

	l.	s.	d.
Food as above	0	2	6
Expences	0	6	7½
Produce	0	2	6
	0	4	1½

	l.	s.	d.	l.	s.	d.
Plowing at 2s. 5¼ l.	0	2	10			
Harrowing at 4½d.	0	0	3			
Carting, at 6½d.	0	0	1			
				0	3	2
Loſs, 2l. 3s. 9d. per acre				0	7	3½

Account of No II.

Expences.

	l.	*s.*	*d.*
Seven plowings	0	1	2
Four harrowings	0	0	1
Seed	0	0	1½
Sowing	0	0	0½
Two hand-hoeings, at 4*s.* and 2*s.* 6 *d.*	0	1	1
Drawing and carting, at 5*s.* per acre	0	0	10
	0	3	4
Rent	0	2	10
	0	6	2

Produce.

	l.	*s.*	*d.*
Food as above	0	8	6
Expences	0	6	2
	0	2	4

	l.	*s.*	*d.*
Plowing	0	2	10
Harrowing	0	0	3
Carting, at 3¼*d.* per load	0	1	0½
	0	4	1½
The above remainder	0	2	4
Profit, 10*s.* 9*d.* per acre	0	1	9½

Account of No III.

Expences.

	l.	*s.*	*d.*
Seven plowings	0	1	2
Four harrowings	0	0	1
Seed, at 5*s.*	0	0	10
Digging the seed-bed and sowing	0	0	2
Planting at 5*s.*	0	0	10
Two hand-hoeings at 5*s.* and 2*s.*	0	1	2
Carried over,	0	4	3

				Brought over,	0	4 3
Four horſe-hoeings at 9*d.*					0	0 6
Cutting and carting at 5*s.*					0	0 10
					0	5 7
Rent, &c.					0	2 10
					0	8 5

Produce

				l.	*s.*	*d.*
Food as above				1	1	3
Expences				0	8	5
	l.	*s.*	*d.*	0	12	10
Plowing	0	2	10			
Harrowing	0	0	3			
Four horſe-hoeings at 1*s.* 2$d\frac{1}{2}$.	0	0	$9\frac{1}{2}$			
Carting, at 3$\frac{3}{4}d$.	0	1	$5\frac{1}{2}$	0	5	4
Profit, 2*l.* 5*s.* per acre				0	7	6

COMPARISON.

	l.	*s.*	*d.*
Profit by cabbages	2	5	0
Loſs by turnips	0	10	9
Cabbages the better by	2	15	9
Profit by cabbages	2	5	0
Loſs by coleſeed	2	3	9
Cabbages better by	4	8	9
Loſs by coleſeed	2	3	9
Ditto by turnips	0	10	9
Turnips better by	2	14	6

OBSERVATIONS.

The loſs on this turnip crop may ſurprize many members of the Society; but I believe the general idea of profitable

ſitable crops (like moſt other *general* ideas in huſbandry) is often fallacious for want of accurate accounts. But I have raiſed much greater crops than this, and made them go much farther by ſtall feeding. The advantage in the improvement of the graſs field cannot be taken into the account.

Coleſeed makes a very indifferent appearance here. The cabbages did not near equal ſome other crops I have had at various times, but they are much ſuperior to the other vegetables.

All three crops would have improved, had they ſtood longer, (although they were ſown very early); but the compariſon remains the ſame. The cabbages, however, would have decayed ſooner than either of the others.

To diſcover which food was moſt agreeable to cattle, I took a cabbage, three turnips, and a bundle of coleſeed, and carried them to another cow: She ſmelt of all, and then bit the turnip; next ſhe bit the cabbage, and eat it up; and then ſhe eat up the turnips, and, laſtly, the coleſeed.

I do not offer this as any ſatisfactory account, but as a hint that ſhould be carried further.

COROLLARIES *to be drawn from theſe Experiments.*

I. Coleſeed is a nouriſhing and wholeſome food, for oxen, cows, ſheep, and hogs.

II. The quantity of its produce (under the preceeding management) is inconſiderable, and not, upon an average, ſufficient to anſwer the expences of culture.

III. The beſt culture is that of ſowing broad-caſt and hand-hoeing, as in the turnip huſbandry; without hoeing it is much worſe, and drilled and horſe-hoed, naught.

IV. Turnips are much ſuperior in quantity and value of produce.

V. Cabbages are greatly ſuperior to it.

[*To be concluded in our next.*]

ARTICLE LIX.

A LETTER *to the* PUBLISHER, *accompanied with* HUSBANDRY ANATOMISED.

SIR,

I Lately fell upon a treatiſe entitled Huſbandry Anatomiſed, "publiſhed at Edinburgh in the year 1697, by James Donaldſon." The account the author gives in his preface of himſelf and his work, is, That he was bred in the country till he was upwards of twenty years of age; and his father keeping ſervants and cattle for labouring a part of theſe lands which heretably belonged to him, he had opportunity to acquire as much knowledge in huſbandry affairs, as was practiſed in that part of the country. When it pleaſed God to call the Prince of Orange to relieve theſe kingdoms from the imminent danger they then ſtood in, he judged it his honour and duty to concur with ſuch a glorious and laudable undertaking; and according to his ability teſtified his affection to the cauſe ſeveral ways, particularly by levying a company of men for his majeſty's ſervice, with which he ſerved in the Earl of Angus's regiment. When he returned to the country, he began to reaſon thus with himſelf; 'What? Have I learned nothing from all that I have 'ſeen and heard, whereby I can be uſeful to myſelf and 'the common-wealth?" At length, conſidering, that he had ſome experience of the way and manner of labouring ground in this country; and had ſeen the way of managing it in other places, which is generally done to greater advantage; he began to try, what might be the cauſes, why there is ſuch difference of increaſe in one place from what there is in another: and found, that it does not proceed altogether from the difference of climate or primitive conſtitution of the earth, but from the difference of management. Theſe he has compared together, and ſhown the difference of profit ariſing from what was the common huſbandry of Scotland at that day, and the more improved method he propoſes.

It is very true, that agriculture is now arrived to great perfection, and is more generally known among our farmers, than it was in this gentleman's days, and the publishing it now may be esteemed of little use: But, in the first place, it is a matter of curiosity to see, that agriculture was not at that early period totally neglected among us; and that the slow progress it has made must be ascribed to other causes, which are pointed out in the introduction to your useful work: And I am convinced, had due regard and attention been paid to this piece at its first publication, we would not at this day have had reason to complain of so many improfitable waste grounds through the country, and of many farms, the greatest part of which to this day are in better than improfitable wastes. And, 2dly, As there yet remain so many farms in the abject situation that Mr DONALDSON was familiar to, and the methods he lays down are but a more improved state of the system of farming practised by such farmers, they will more easily be convinced of the propriety of his advices, and will be readier to practise them; than it can be supposed they will be, with respect to those more improved methods of agriculture, now become familiar to a great part of the country.

This has induced me to abridge this treatise, leaving out every thing that was extraneous to the subject, in hopes, that it may be of some service to such of my brethren as stand most in need of it. The calculations are agreeable to the prices of grain and other country product at that time, none of which I thought myself at liberty to alter: And as they are made in Scots money, they will be more agreeable to our country people, and better understood by them. If you think the publication of it in your Farmer's miscellany will be of service to my countrymen, you are welcome to it; and if I have the satisfaction to learn, that even one man has benefited by it, I shall think my labour well bestowed.

I am, SIR, &c.

Clackmannan-shire,
25th July 1774.

HUSBANDRY ANATOMIZED: *Or, An Enquiry into the preſent manner of Tilling and Manuring the Ground in Scotland, for the moſt part; and ſeveral Rules and Meaſures laid down for the better Improvement thereof; inſomuch, that one third more Increaſe may be had, and more than a third of the Expence of the preſent way of Labouring ſaved.*

By JAMES DONALDSON.—*Edinr.* 1697.

WHEN Almighty God created the world by the word of his power, he could have made man to have lived without food, as well as he did the Angels: Or have made the earth to have brought forth all manner of food for him, without labour or Induſtry, as it doth for cattle and creeping things: But ſo it was, that he who is infinite in wiſdom, ſaw it meet to aſſign to man a daily exerciſe in earning his food and raiment; whereby he is not only diverted from following ſome bad practice, but alſo that he may thereby ſee his great frailty, in that he is not able to live without daily ſubſiſtance and refreſhment from creatures inferior to himſelf; and that he may thereby learn to know his great need of ſpiritual nouriſhment to his ſoul, in as much as it is more precious than the body, together with many other profitable leſſons.

No doubt, if man had continued in the ſtate of Innocence, his labour had been rather a pleaſure, than a toil; as may be gathered from the ſentence pronounced againſt Adam; when it is ſaid, "From thenceforth by the ſweat "of his brows, he ſhould earn his bread, until he ſhould re-"turn into the duſt." It is plain enough, it had not fared ſo with him, but for his tranſgreſſion: And upon Cain's tranſgreſſion the earth is again curſed, that thenceforth it ſhould not yield its ſtrength. What wonder, tho' before this time it had become a barren wilderneſs, conſidering the

the daily multiplied tranſgreſſions of the children of men. But this being extraneous to my purpoſe, and what I can not decipher, I remit to the conſideration of divines.

My preſent purpoſe is,

1. To take ſome general obſervations on the preſent conſtitution of the earth.

2. To lay down certain rules for bringing every kind of ground to a right temperature, ſo far as may be.

3. To enquire into the preſent method of manuring the ground, thro' moſt parts of this kingdom.

4. To lay down ſeveral rules for manuring it to greater advantage, tho' not incloſed.

5. To ſhow, to how much greater advantage that may be done, by parking and incloſing.

6. To give ſome directions concerning ſtock keeping.

7. To do the ſame concerning planting.

8. How to ſow ſeveral garden ſeeds and roots.

Laſtly, I ſhall anſwer what objections may be framed againſt any of my propoſitions.

CHAP I.

Of the Earth's conſtitution in general.

Notwithſtanding, there is no Effect but from ſome certain Cauſe, yet there be many things true in effect, whereof we do not well know the cauſe. I hope therefore the reader will not diſregard my propoſitions, where the fact is evident, tho' I cannot give a philoſophical account of the cauſe.

It is allowed, that in ſome places the earth is moiſt and cold, in others hot and dry. Some inſcribe this to the influence of the Planets: But it cannot be ſuppoſed, that their influence can operate differently in the bounds of a mile of ground, in which we find one field hot and ſandy, another cold clay; a third marſhy and boggy, a fourth dry heath, and

and the fifth a tolerable mixture of all theſe. Theſe differences muſt therefore be referred to the primitive conſtitution.

Now, to bring each of theſe different kinds of ground to ſuch a temperature, as to be in a condition to nouriſh any plant or ſeed, the ſuperfluity of that quality which prevaileth muſt be removed, and that quality which is weak muſt be ſtrengthened. For, as in human bodies there are a compoſition of the four elements, by the ſuperfluity or deficiency of any one of which diſeaſes are contracted; ſo in the earth, there is the like compoſition of qualities; and ſo far as heat, moiſture, cold or dryneſs exceeds the bounds of a moderate temperature, ſo far it is diſeaſed and rendered unfruitful.

I know ſome aſſert, that ſalt, or the hot quality that is in the earth, is the only cauſe of the growth of vegetables; and conſequently that barrenneſs is owing to the want of this quality. I confeſs, where this quality is wanting altogether, barrenneſs cannot but enſue, and that this quality is that which is moſt frequently deficient in our cold climate; and moreover, tho' it be ſtrengthened and aſſiſted, yet by tilling and manuring the earth, it is extracted forth into the ſubſtance of grain and other vegetables, and ſo needeth frequently to be renewed. Notwithſtanding all which, I am of opinion, there may be abundance of this hot or ſalt quality, where there is as much barrenneſs as any where elſe.

To confirm this aſſertion, I have ſeen a field fattened ſufficiently with dung, yet, by reaſon of great drought, yielding ſmall encreaſe, ſcarce a third of what it has done at other times: The cauſe ſurely was not for want of this hot or ſalt quality, but ſolely for want of moiſture. Again, I have ſeen a field that wanted not enough of this hot quality, and, by exceſſive rains, after it has been tilled

and

and ſown with good grain, has produced little beſides weeds and thiſtles: I have alſo ſeen ſtrong clay ground, where the clods remained firm and unbroken, not produce ſo much by far, as at other ſeaſons, when, by the froſts in the winter, the clods have been mouldered down, tho' it was otherwiſe in no better condition. Theſe things convince me, that the want of air, tho' there be a moderate temperature of the other qualities, hinders the groweth of vegetables: For tho' they want not air in the ſtalk, which is above ground; yet in this confirmed earth, the air cannot have free acceſs to the root. Another thing which confirms me in this opinion is, that where trees grow cloſe, and near the bottom of hedges, little or nothing grows: Moreover, I have ſeen where the bottom of a dung-hill has been plowed and ſown, that round the borders the corn has been ſtrong and good; but where moſt of the ſtrength of the dung remained, little or nothing has grown; which evinces, that the exceſs of this hot quality, though there be a moderate temperature of all the reſt, doth hinder fruitfulneſs.

It is obſerved, that valleys are generally more fertile than hills. This is accounted for from various cauſes, 1. Their being nearer the internal or central heat of the earth. 2. The reflex heat of the ſun-beams from the higher ſurrounding grounds. 3. That the hills being more expoſed to the air when in motion, which is much colder than when it ſtandeth ſtill; and the valleys being much ſheltered from the violence of ſtorms, they are kept ſo much the warmer; and conſequently the more fertile. 4. The hills being ſteep, the rain runs preſently off, ſo ſoon as it falls; and not only carries along with it that hot or ſalt quality that is in it; but if the ground be not well ſwarded, it carries part of the earth alſo away with it. On the contrary, as valleys lye near level, the rain cannot ſuddenly run off; but as it gets time

time to ſink and ſoak into the ground, the ſalt quality remaineth ſtill, whereby the earth is much enriched. From hence it is evident, that it is heat chiefly that makes the valleys more fertile than the hills: It therefore follows, that if other ground can be warmed to the like degree, it may thereby be made as fertile. This is what I ſhall attempt to give ſome directions for in what follows: And ſhall here obſerve, that it may be brought about in two ways; firſt by aſſiſting the internal heat; and ſecondly by reſtraining the external cold.

CHAP. II.

How to bring every kind of Ground to a right temperature, ſo far as may be.

Now, like a ſkilful phyſician, after finding out the diſeaſe, let us preſcribe the remedy, by ſhowing what kind of nouriſhment or medicine is required to refreſh the ground, or bring it to a temperate conſtitution

Dung of all ſorts, particularly dung of cattle, vegetables of all kinds if fully rotted, aſhes, lime, marle, ſea-ware, are the great means for this end: ſome of them are ſtronger than others, and each of them proper to be applied to different kinds of ground.

1*ſt*, Marſhy ground, if it be plowable, ſhould be made in high ridges, and ſheep or horſe dung is fitteſt for it. If it be ſo moiſt, that it cannot be plowed, draining the water off by trenches or ditches, and ſtrowing it with coal or wood-aſhes, will much help the growth of good graſs, and deſtroy ruſhes or any other hurtful weeds.

2*dly*, Where the earth is ſandy and hot, it ſhould be fattened with cow-dung or marſh earth; for as its conſtitution is too hot already, dung of a contrary quality muſt be applied. But if it be exceſſive hot, it can hardly be made fertile, unleſs a great quantity of clay or marſh earth be laid

laid on it, the expence of which will exceed the profit. In that caſe, I know nothing better than to take what graſs it produceth of itſelf, and not ſpend ſeed and labour in vain: For though in a wet ſeaſon it may bear a pretty good crop, yet ſeeing a drought may as readily happen, it is ſafer to beſtow expence on other ground, where more certain profit may be expected.

3*dly*, Strong clay ground, the nouriſhment moſt proper for which is horſe or ſheep dung. This kind is capable of as much improvement as any whatſoever: But as there are two maladies to be removed, cold and aſtringedneſs or hardneſs, eſpecially when a dry ſummer follows a wet ſpring, beſides the dung, take ſea-ſand or other ſandy earth, and ſpread it as dung: This will help to keep the ground open, and alſo mitigate the cold. Another thing that makes this ground open and tender is fallowing; and alſo ſowing it with peaſe or beans, which ſhould be ſown every third or fourth year at leaſt.

4*thly*, The next kind is the mooriſh earth, wild and overgrown with heath. This Shrub groweth only on cold dry ground, where ſcarce any thing elſe can grow: Yet by removing that cold dead light earth that is on the ſurface where the heath grows, the ſoil may be made pretty fertile. The manner of managing this kind of ground is this: It is dug up in turfs, which being dried, they are gathered in ſmall heaps and burnt; the aſhes are ſpread in September or October; then ſow it with wheat or rye, and plow it down with a light fur. The firſt year's crop will do more than reward the labour; and ever after, it will be fit for grain or paſture, as your other ground.

The turfs are cut in two methods; either by a hoe, ſtriking the turf on its four ſides, and ſo digging it up; or by a plough made for the purpoſe, whereby the ground is ſlit at diſtances of about a foot from one another; then croſſing

roffing at the ſame diſtances, all the edges of the turf are ut, ſo that they need be only cut at the bottom. In the ſt method, where the bottom of the turf only is to be cut, ght men may prepare an acre in a day; but in the firſt ethod, they will not do half an acre. You may cut the round either with the common plough, by lengthening e coulter three or four inches lower than the ſock; or to ake a ſlype after the common manner, only add a croſs-eam, and therein place two or three coulters, providing ey be thin and of good mettle: lay a weight on the ſlype; nd it will ſlit the ground as deep as the point of the oulters go.

CHAP. III.

How to manage the Ground to better advantage, though not incloſed.

But as generals are not ſo convincing as deſcending to articulars, I ſhall compare the preſent way of managing he ground with that which I am now to propoſe. But s grounds differ much in degrees of richneſs, it may be aid, the inſtance I give cannot be a rule for managing all orts of grounds. Yet thereby any perſon may know, ow to manage every kind of ground: For if the ground is aturally fertile, or lying near any place where dung can e had, more land may be taken into dunging; and where he ground is leſs fertile, or ſmall opportunity of getting ung, then leſs ground muſt be taken into dunging, than hat I propoſe. In a word, it is a general rule, to dung o more than can be dunged ſufficiently,

I ſhall ſuppoſe a farmer to have a tack of threeſcore cres at 300 merks, or L. 16 : 13 - 4. This is commonly ivided into two parts; one third, croft; and two thirds, utfield. The croft is uſually divided into three parts; ne third ſown with barley, which is always dunged that

year; one third oats, and the other third peaſe. T
outfield is divided into two parts; the one half oats, a
the other half graſs, two years ſucceſſively.

The product of this farm in corn may be ſuppoſed
be four bolls for each acre of croft, and three for ea
acre of outfield.

Let us next examine, what profit the farmer makes
his cattle. Beſides four horſes, which are uſually ke
for plowing the land, ten or twelve nolt are common
kept upon ſuch a farm as this. The twenty acres of gr
cannot be ſuppoſed to be very good, as it does not lye abo
two years, and cannot be well ſwarded. Little profit ther
fore can be had of the cattle; two or three ſtones of bu
ter is the moſt that can be expected of the cows, and n
above two queys brought up each year. The profit fro
breeding young horſes, cannot be counted on; for if
keeps up his ſtock by his own breeding, it is very fair. T
whole product of his cattle cannot then be reckoned abo
fifty merks, or, L. 33-6-8.

The whole product will ſtand thus,

20 acres of croft at 4 bolls, is 80 bolls		
20 acres of outfield at 3 bolls 60		
140 bolls		
which reckoning the price of victual, one year with another, at L. 5 Scots *per* boll is	L. 700	
20 acres of graſs yields of profit on his cattle	33	6 8
Total Product,	L. 733	6 8

The expence of management comes next to be conſider
ed

d: The firſt coſt of the ſtocking may be about L. 800 L. 900, the intereſt of which ſhould be ſtated in the firſt lace: But this I ſhall omit.

The produce as above ſtated is		L. 733 6 8
The rent is	200	
Seed reckoned 40 bolls, being a boll to the acre, at L. 5 per boll	200	
Maintainance of the family, reckoned to 40 bolls	200	
For the horſes I allow 16 bolls	80	
		L. 680 0 0
Remains		L. 53 6 8

Which is all that the farmer has to pay his ſervants wages, and furniſh cloaths and other neceſſaries to himſelf nd family, excepting the little induſtry by ſpinning or otherways to be made by his wife and maid. Now, he cannot abour the farm with leſs than two ſervants and a maid, eſides a herd boy in ſummer, and the additional ſervants required in harveſt; for which the above ballance muſt be bſolutely inſufficient.

No more ſervants and horſes are requiſite to labour one alf more ground, that is thirty acres, in all 90. And if only the product, according to their proportions, was equal, hen the expence of ſeed, and labouring of theſe additional hirty acres, will be wholly ſaved, which of itſelf is a conſiderable profit. But I ſhall ſhow, that not only this expence may be ſaved, but the product will be conſiderably greater.

Theſe 90 acres, I treat thus: 66 I ſet apart for outfield, which is divided into three parts; two thirds I leave in graſs, and one third is plowed for three years only; thus every third is plowed three years, and lyeth fix ſucceſſively.

Of

Of the other 24 acres, I make two of them into a gar
den or orchard; half an acre thereof I plant with cabbag
and kail, and ſow with roots for family uſe; the othe
acre and half I leave in graſs, and plant the whole wit
fruit trees, at the diſtance of 30 foot, which hinders no
the growth of the graſs or herbs beſide them; and in 1
or 12 years much benefit may be had from the fruit.

The 22 acres that remain with half an acre from th
outfield, I divide into five parts, of four acres and a hal
each. One of theſe I dung the firſt year for barley; th
next year I ſow it with wheat; the third with peaſe or oats
the fourth with oats or peaſe; and the fifth year I leav
it in graſs, or if I think fit fallow it. Thus I have fou
acres and a half dunged every year, for which there is dun
in abundance, becauſe a far greater number of cattle ca
be kept on this farm than on the former, having thre
times as much graſs; for though there be not three time
as many acres, yet it will be better ſwarded by lying ſix
whereas in the other it lay but two years. And as ſix o
ſeven acres of the former were dunged every year, the
preſent four acres and a half will have a far greater al
lowance.

Each acre of this croft, ſo well dunged, may be allowed
to produce eight or ten bolls; but I ſhall reckon only ſe
ven bolls; and the outfield four bolls, which, after lying
ſix years, is not unreaſonable, ſeeing I allowed three to
the outfield of the former farm, which had layn but two
years.

The

The product will ſtand thus,

Outfield 22 acres, at 4 bolls per acre	88 bolls	
Croft 18 acres, at 7 bolls per acre	126	
	214	
Which at L. 5 per boll is		L. 1070
But a fourth part of the croft being ſown with wheat, we may reckon on 24 bolls, beſides its own ſeed, which is at leaſt a crown per boll better than other grain; therefore add	72	
Total produce of grain		L. 1142

As to the ſtock of cattle to be kept; on the former farm, four horſes, and ten or twelve nolt was the number, though there was three times as much graſs as on this. Now, I ſhall not endeavour to augment the number, ſo much as to mend their condition; for as I formerly obſerved, our cattle are generally half ſtarved, which keeps them both ſmall and lean. Let us therefore keep here only two horſes, four oxen, eight or ten milk cows and a bull. We may reckon ſix calves every year: the ſtock of young cattle will come to be, ſix calves, ſix of a year old, and ſix of two years old; and when they come to be three years old, they come into the account of cows or oxen. Now, as there are in graſs forty-four acres of out-field and four and a half acres of croft, and the graſs of the orchard, which I reſerve for hay to give the cattle when ſick, or for the ſheep in a ſtorm, I may well keep forty or fifty ſheep beſides.

Of the 10 milk cows, there may be made 16 or 20 ſtones of butter at L. 2 : 18 per ſtone	L. 46 8 0
Three oxen and three cows will be to diſpoſe of every year, and in reſpect they will	
Carry over	L. 46 8 0

Brought over		L. 46 8 0
be better fed than cattle commonly now are, in regard the paſture is not overlaid, I can ſell four of them at Hallow-day at L. 18 each		72 0 0
Two of the oxen I feed till February or March, having fodder in plenty, and ſell them at L. 30 each		60 0 0
On the horſes I reckon neither profit nor loſs: Of the ſheep we may reckon 20 to be brought up every year; ſo that 20 of the old ones may be ſold, 8 of the weakeſt at Hallowday at 40 ſhillings a piece		16 0 0
And 12 of the beſt I put into the orchard and feed them there till Candlemaſs, when they may be ſold at L. 4 4,— the piece		50 8 0
The wool may be reckoned at		36 0 0
Beſides I have in my orchard four or five bee-hives, which may be keeped at little or no expence, and may yield yearly		24 0 0
The half acre of garden ground, which I have in herbs and roots, may well ſave 12 or 16 bolls of grain in the maintainance of the family; but I ſhall reckon for it only		50 0 0
To this add the produce of the victual		1142 0 0
	L.	1496 16 0
The produce of the former farm was only		733 6 8
Difference of profit	L.	763 9 4
The expence of labouring and ſeed is the ſame in both; for ſeeing I labour but 40 acres in each, the ſame number of ſervants and quantity of ſeed anſwers both. But as I have 30 acres of more ground than in the former, the rent of theſe 30 acres at the ſame rate is	100 0 0	
And as the landlord will probably give me ſome encouragement at my firſt ſtocking the ground, by		
Carry over	L. 100 0 0	L. 763 9 4

Brought over L. 100 0 0		L. 763 9 4
truſting me for ſome years a part of the rent, till the ground is improved, and that he will probably give me a tack of ſome conſiderable endurance to encourage me to improve, I ſhall allow 30 bolls of additional rent, which is	150 0 0	
Additional rent		L. 250 00
There ſtill remains		L. 513 9 4

More profit than can be made of the firſt farm, as at preſent farms are managed thro' the greateſt part of the country.

But this is not all; for having allowed only two horſes, and four oxen, and theſe laſt need not be fed with corn as the horſes are, three or four bolls will ſerve them; ſo here are four bolls ſaved of the ſixteen allotted for the horſes. This however is but a part of the profit had by labouring with oxen; for you ſee L. 60 may be made every year by ſelling two oxen, after they have laboured for two or three years, which cannot be made of horſes; for tho' ſome may make benefit by bringing up horſes, all cannot further them to get ſervice of them while they live; for all of them muſt once die in ſome body's cuſtody. But becauſe oxen are not ſo good for every ſervice as horſes, I recommend a part of each as moſt convenient and beneficial.

I ſhall likeways ſave ſix or ſeven bolls of ſeed, from the following conſiderations: Let any perſon obſerve, and he will ſcarce find a ſtalk of any kind of corn, that has not a dozen of grains on it, ſome not fewer than thirty or fourty; beſides ſeveral ſtalks from one root; from which we may infer, that the product is not leſs than twenty-four fold; and yet in common ſix or ſeven is thought to be no bad increaſe; ſo that we may believe, a third of the ſeed

ſown

ſown does not come to perfection. That may be aſcribed to two cauſes; either the roughneſs of the ground, by which the ſeed is buried too deep, and is choaked for want of air; or lyes too dry, and does not chip for want of moiſture. Now, in malting grain, ſcarcely one of ten, nay of twenty, but is found ſprouted: If the ſeed ſown were as much moiſtened, it would as univerſally ſprout; and very little grain that is once ſprung above ground, does afterwards fail, unleſs when the ſeaſon is very intemperate. I therefore recommend ſteeping the grain twenty-four hours in pure water; then ſpread it on the barn floor till the water runs from it; and dry it before ſowing with powdered lime: And though it lye three or four days, it will not ſuffer; for it comes as faſt on the barn floor, as if it were ſown: Before ſowing, give the ground a courſe of harrowing, which will prevent its falling too deep; and then harrow it till it be enough. And by taking this method, and the ground itſelf being in good heart, three pecks of ſeed may be ſaved on each acre, which on fourty acres is a ſaving of more than ſeven bolls. It may be objected, that the ſteeping of ſeed ſeems to contradict the general obſervation, that a dry ſeed-time is of all the moſt ſeaſonable, according to the vulgar proverb, That a boll of March duſt is worth a boll of gold: But it is not ſo much the exceſs of moiſture in the ſpring, as of cold joined with it, which prevents the ſeed from ſpringing before it rots: And another bad conſequence of a wet ſeed-time, is, the ground being plowed and harrowed wet, whereby it is kneaded together like leaven, and drying afterwards, it hardneth like a cake, and thereby prevents the air having acceſs to the ſeed or root of the ſtalk; beſides, the weeds are much encouraged by a cold wet ſpring, and getting above the corn before it riſes, they keep what advantage they get.

[*To be continued in ſome future* NUMBER.]

THE SCOTS FARMER,

AUGUST 1774.

ARTICLE. LX.

Of the Culture of Turnips.—Of the culture of the Carrot—Of the Culture of the Parſnip.

[From DICKSON'S AGRICULTURE, Vol. II.]

Of the Culture of Turnips.

TURNIPS have been long cultivated in England, and in ſome places are reckoned one of the moſt valuable crops that the farmer can raiſe. The trials made in Scotland have been very ſucceſsful, and there is great encouragement to proceed.

The turnip was cultivated antiently by the Romans. Columella mentions it as a root proper to be cultivated, not only as it filled the bellies of the ruſtics, but alſo as it ſerved for food to cattle in the winter ſeaſon. It requires, he ſays, a rotten crumbling looſe ſoil; and he recommends that the land intended for it be frequently plowed and well dunged, not only for the ſake of the crop of turnip, but alſo becauſe after a plentiful crop, the land thus managed bears excellent corn. In lands that are well watered, he directs that the ſeed be ſown ſoon after the ſummer ſolſtice, but in dry lands not till the end of Auguſt or beginning of September. * It is probable, that in lands naturally dry, ſoon after the ſolſtice, there was not moiſture enough to make the turnip ſeed vegetate, and that it was not till after the eaſtern winds ceaſed to blow,

* Col. lib. 11. chap. 2.

blow, which was commonly in the end of Auguſt, that rain was expected; and that this was the reaſon why the ſowing of the ſeed upon ſuch land was delayed till that ſeaſon.

There is very little difference betwixt the culture recommended by Columella, and the culture commonly given to the turnip at this day: And we have no reaſon to be ſurpriſed that turnip ſown in June upon rich ſoil well dunged, ſhould riſe in that climate to 40 pound weight, as is mentioned by Pliny.†

The goodneſs of the crop of turnips depends rather more upon the openneſs of the ſoil, than its richneſs. Land newly broke up is particularly proper for them. This kind of land, tho' naturally poor, yet, with the aſſiſtance of a little dung, ſeldom fails to produce a good crop. The land intended for them ſhould be plowed before winter, that it may have the benefit of the froſt, and be laid up in ſuch a manner as to be ſecured againſt all damage from the winter rain. I have had frequent occaſion to obſerve, that land, when it is laid up in ridges, has a rough ſurface, is much better expoſed to the influence of the froſt, and much better ſecured againſt rain, than when it is allowed to lye with the ſmooth ſurface it has when the crop is taken off; and therefore when land is plowed before winter, it is natural to expect to find it in a better ſituation in the ſpring, than if it had remained unplowed. This winter-plowing is not neceſſary when the land is dry and light. It is early enough to give this kind of land the firſt plowing in the ſpring. It may receive a ſecond in the end of May, and a third in the middle or end of June, when the ſeed is to be ſown. Tho' three plowings are here mentioned, yet it is improper to mention any particular number, as the moſt proper; for the land ſhould be plowed over and over, till thoroughly pulverized.

† Plen, Nat. Hiſt. lib. xviii. chap. xiii.

If dung is to be laid on, this ſhould be done before the laſt plowing, and it ought to be well rotten; for rough dung gives too great advantage to the drought, which is ſometimes very great at the ſeaſon of ſowing.

As the different plowings are at ſome diſtance from each other, weeds may probably ariſe to too great a height before they are plowed in; but when there is any danger of this, they may be deſtroyed by harrowing.

The ordinary way of ſowing turnip is out of the hand, and about half a pound is ſufficient for an acre. The ſeed ſhould be mixed with ſand, that ſo it may be ſcattered the more equally, the land ſhould be a little rough when the ſeed is ſown, and plenty of ſeed given. The roughneſs of the ſurface occaſions the ſeed to be covered at different depths, and the giving plenty of ſeed, ſecures a crop, tho' ſome of the ſeed ſhould be buried too deep. Tho' it is the intention in ſowing, that the whole ſurface ſhall be covered, yet certainly it is better to ſow by a drill than by the hand. When the turnips ſtand in rows, they are more eaſily hoed, than when ſown at randóm, and there is no danger that the labourers miſtake them, and hoe them up inſtead of weeds, as has been done ſometimes. The turnips being eaſily diſtinguiſhed by the rows, may be hoed much ſooner than ordinary, which is an advantage to them; and beſides, the drill may be ſo conſtructed as to lay ſome of the ſeeds a little deeper than others, which will make ſome difference in the time of their coming up, and thereby be a means of ſecuring the crop from the fly, by which it is ſometimes wholly deſtroyed.

It is needleſs to give particular directions about hoeing. This operation ſhould be performed as ſoon as the plants can be diſtinguiſhed, and with all imaginable care. As a much greater number of plants commonly come up than ſhould be allowed to ſtand, the labourer uſually puts his foot

foot upon the ſtrongeſt plants, and hoes up both weeds and turnips to a conſiderable diſtance around.

It is important to begin this operation of hoeing as early as poſſible, that ſo all encouragement may be given to the growing of the young plants at firſt. The turnip is a quick grower, and if it meets with any diſcouragement at firſt, becomes ſickly, and never can be recovered ſo as to produce a large root.

Turnips may be cultivated with great ſucceſs in the new huſbandry. They have been tried in ſingle, in double, and in triple rows. It is generally allowed, that they ſucceed beſt in ſingle rows, and in alleys from four to ſix feet wide, according to the ſituation of the land. The poorer that the land is, or the more difficult to be reduced, the alley ought to be the wider.

After the ridges are formed, the turnip ſhould be drilled upon the crowns; and as ſoon as they come up, and are paſt all danger from the fly, they ſhould be horſe-hoed, it is of importance to begin this work very ſoon, for without this it cannot be properly done. The nearer that the plough goes to the rows, it has the greater effect; but this cannot be done if the earth is turned from them on each ſide: When the plough has gone near, and taken the earth from one ſide, ſhould it go near on the other, the reſiſtance which the mould board meets with in turning the furrow, preſſing the plough in the oppoſite direction againſt the ſmall ridge of earth upon which the row of turnips ſtands, is in danger of turning it into the open furrow on the other ſide of the row, and thereby deſtroying the plants. To prevent this, the alleys ſhould be plowed alternately, and after the earth has lain a few days expoſed, it ſhould be thrown back again towards the rows, and then the intervening alleys ſhould be plowed in the ſame manner. This manner of hoeing, allows the plough to go very near the rows without any danger, which is a great advantage to the

the plants, and makes them puſh their roots quickly at firſt. But this cannot be done unleſs the plowing is early begun, for if it is late, the weeds are allowed to come too great a length before the laſt of the alleys are plowed. It is not neceſſary to mention, that the rows muſt be carefully hand-hoed, and the plants taken out when they are growing too thick. Two other hoeings are ſufficient: the firſt from the rows, and the other to them. Theſe hoeings may be at ſome diſtance of time from each other, and it is not neceſſary to go ſo near the rows as at firſt.

In preparing land for a crop of turnip to be horſe-hoed, there ſhould be as great a depth of looſe earth as poſſible, placed where the rows are to ſtand. This allows the plants more eaſily to puſh their roots downwards, and makes them ſtronger before they meet with any hard earth to interrupt them. To effect this, let the ridges at the firſt plowing be formed exactly of the breadth intended for the rows of turnip. When this is done, let the furrows betwixt the ridges be made as deep as it is poſſible for the plough to go. At the ſecond plowing, let the firſt be reverſed, and the furrows turned into crowns; and at the third, inſtead of reverſing the ſecond, let the crowns be ſtill higher raiſed. By this means, there will be a conſiderable depth of earth, where the rows of turnip ſtand, and their growing greatly encouraged.

It is certain, that a field cultivated in this manner, will carry as large, if not a much larger crop, than when cultivated in the ordinary way. The expence of hoeing by the plough, though done more frequently, is not greater than the expence of hand-hoeing, and the land when horſe-hoed is left in a much better ſituation. The benefit of theſe plowings given is not confined to the crops of turnips; by them the weeds are more effectually deſtroyed than by hand-hoeing, and the ſoil better prepared for the crops that follow. Beſides by this culture, the turnips draw more of their nouriſh-

nouriſhment from below the ſtaple of the ſoil. The better that any plant is nouriſhed, it becomes the ſtronger, and not only increaſes in bulk above ground, but alſo puſhes its roots the further below. Now the culture given to turnips by the horſe-hoeing, renders them larger and ſtronger. Hence they puſh their roots the further down, and draw the greater quantity of food from below the ſtaple of the ſoil; ſo that a crop of horſe-hoed turnips, of equal weight with a crop raiſed in the common way, being larger, and having longer roots, do not draw ſo much of their nouriſhment from the ſoil near the ſurface, and therefore muſt leave the land in better order.

The only objection to the raiſing turnips in this way, that deſerves to be taken notice of, is this: When the ſeaſon is unfavourable, it ſometimes happens, that the turnips fail on ſome parts of the rows, which occaſions large blanks in the field. But this is in no great danger of happening when the work is right executed. If the hoe-plough is bad, and the workman unſkillful, the earth that falls from the plough to the left ſide, ſometimes buries the plants in the rows; but if the plough is right made, and the plowman attentive, this ſeldom happens, and if it ſhould in ſome places, the defect may be in a great meaſure ſupplied, by taking ſome of the plants in the rows where they ſtand too thick crowded, and tranſplanting them into the vacancies. For this purpoſe, the young plants ſhould be taken up when the land is moiſt, the long root ſhould be cut, ſo as to leave it about three inches long, and the leaves cut of within an inch of the crown. If theſe things are attended to in tranſplanting, ſcarcely one plant will fail, unleſs a ſevere drought follows; and if they are not long in ſtricking root again, the tranſplanted turnips will be as large as any in the field.

The turnip is proper food either for ſheep or black cattle. If the land is dry and needs manure, the ſheep are folded

folded upon the turnip. The fold muſt be removed every day, for it is improper to give them the liberty of more at once than they can conſume in that time. When the land is wet or very rich, the turnip may be pulled, and the ſheep fed with them upon a field that needs to be manured. By proper care in laying down the turnip, the ſheep may be made to dung the field regularly and equally.

When the turnips are deſigned for black cattle, they muſt be pulled up and given them, either in ſtalls or in another field, as found moſt convenient.

When it is propoſed to feed ſheep with the turnips on the fields where they grow, it is reckoned moſt proper to raiſe them in the ordinary way, and when it is propoſed to pull them up and give them to the cattle, either in ſtalls or in another field, it is reckoned beſt to raiſe them in the horſe-hoeing huſbandry.

Of the Culture of the Carrot.

The carrot is a plant as yet very rarely cultivated in our fields, and indeed it would be to very little purpoſe to attempt it, if there can be found no other conſumpt for the crop, than what the preſent market affords. A very ſmall addition to the quantity at preſent brought to market, would entirely ſatiate it, and reduce the farmers' pains and expence to a very ſmall account. But the farmer has a market for theſe roots at home, and when the corn is high priced, they may be a very great ſaving to him. Horſes have been tried with them, and it is found that they eat them greedily, and are very well fed by them. It is not difficult to raiſe them; a very ſmall field is ſufficient, and the trial may be made by every farmer, at a very ſmall expence.

The manner in which the beſt crops of carrots are raiſed in our gardens, naturally points out to us the proper way of raiſing them in the fields.

The

The beſt crops of carrots in our gardens, are produced by trenching. When the ſoil is hard below, though it be well dunged, yet it does not produce a good crop. Whenever the roots of the carrots reach the hard ſoil, they become forked, as the gardners call it, that is, the roots divide; and whenever this happens, tho' the roots may become large at the crown, yet the crop is never good, as there is nothing below where they begin to fork, that is good for any thing. But deepneſs of earth is not ſufficient, unleſs the earth below is proper for the nouriſhment of this plant. This earth below when proper for this purpoſe, invites as it were the roots of the carrots, to extend themſelves into it. Trenching ſerves both purpoſes; it both makes the earth deep, and, by throwing what was on the ſurface into the bottom of the trench, lays proper ſoil below for the roots to extend themſelves into; ſomething like this muſt be done in our fields, before we can expect a good crop.

Mr Lunin de Chauteau vieux, tried to raiſe a crop of carrots in the manner of horſe-hoeing, and was very ſucceſsful. He ſowed them in beds ſix feet in breadth on the fourth of May. He ſtirred the alleys with the ſpade, on the 15th and 27th of July, and a third time on the ſixth of September. They were digged up on the 8th of November, meaſured from 18 to 25 inches in length, and from 2 to 4 inches diameter, and weighed from 25 to 33 ounces. The horſe-hoeing huſbandry ſeems to be the moſt proper for this root, and indeed the only culture that can be ſuppoſed to raiſe a good crop of it in the field; and as ſome perſons may chooſe to try to raiſe it in this manner, a few directions ſhall be given, which the manner of cultivating them in the garden ſeems to point out.

Land that has a hard bottom of clay, till, or any ſuch thing, is not proper, and it is vain to ſuppoſe, that by the plough, ſuch land can be prepared for them without a great

reat deal of trouble. Such land in a garden may be renched, and the clay or till thrown up to the ſurface can e mellowed by dung. By this the ſoil is rendered proper for crop of ſuch roots, and ever after fit for being trenched. Though ſome kind of imitation of this might be done by he plough in the fields, yet the trouble and expence muſt be ſuch, that no perſon can be ſuppoſed to engage in it, without a ſtronger aſſurance of a good crop than can be given. No farmer, therefore, ſhould attempt to raiſe a crop of carrots upon this kind of ſoil.

The land upon which any attempt is to be made, muſt have a ſoft bottom, and if this is the caſe, and the land but tolerable, I make no doubt that a good crop of carrots may be raiſed at a ſmall expence by horſe-hoeing.

As the ſeed muſt be ſown in the month of March *, it is neceſſary that the land get a plowing before winter. At this time it ought to be laid out in beds or ridges, of the breadth propoſed, when the carrots are to be ſown, and the furrows betwixt the ridges ſhould be made as deep as poſſible, becauſe it is above theſe furrows, that it is propoſed, that the rows of carrots ſhall be ſown. A ſecond plowing in winter ſhould reverſe the firſt, and turn the furrows into crowns, and before the carrots are ſown, one out of the plough may raiſe the crown of the ridge ſtill higher. Upon theſe crowns the ſeed ſhould be ſown. As it is not propoſed that large fields ſhall be employed in this way, the ſeeds may be ſown out of the hand into a little trench, drawn as ſtraight as poſſible, and covered with a rake.

When the weeds firſt appear, the remaining part of the ridges may be plowed out, turning the earth to the rows

* M. de Chauteau Vieux ſowed the carrots, which he tried in May, but March is certainly the proper ſeaſon for the climate of Scotland.

careful not to go ſo near as to cover the plants. Wh
giving directions about the culture of turnips in this ma
ner, it was propoſed to plow the whole ridge before ſo
ing the turnip: It is now propoſed in the culture of c
rots, that before their ſeed is ſown, inſtead of plowi
the whole ridge, the plough ſhould only go once about
the crown. This difference ariſes from the differe
ſeaſons of ſowing. The turnips are ſown in June, t
drieſt ſeaſon; and therefore every method muſt be tak
to preſerve the ſap, which is beſt done by plowing the wh
ridge; whereas the carrots are ſown in March, in whi
ſeaſon there is no want of ſap to make the ſeed vegeta
On the contrary, there is often too much rain, which
hurtful, and the beſt way to ſecure the ſeed from being hu
by it, is to have an open trench on each ſide of the row
to receive the water: This is made by the plough goi
once round on the head of the ridge.

As ſoon as the plants can be eaſily diſtinguiſhed, th
ſhould be hand-hoed, and ſome of them taken away whe
they ſtand too thick. After this, if the alleys are reg
larly hoed in the manner directed in the culture of tu
nips, I am perſuaded the crop will not be bad. The ſe
being ſown where there is a conſiderable depth of eart
and being well nouriſhed, will quickly puſh down its roo
and the plants being ſtrong and vigorous, when the roo
reach the bottom of the furrows, will eaſily puſh furth
through the ſoil below. When a plant is ſtrong and v
gorous, it is natural to ſuppoſe, that its roots mak
their way, and overcome impediments that would effe
tually reſiſt them if weaker. In the ſame bed of carro
in our gardens, we obſerve ſome of the roots long an
ſtraight, others of them ſhort and forked: The occaſion
the roots being forked, is well known, to be their meetin
with reſiſtance, in puſhing themſelves downward; an
thus, where land is well dunged on the ſurface, and has
ha

ard bottom, many of this ſort are diſcovered. Now, it ldom happens, that any of the plants meet with ſuch reſtance ſo near the ſurface as their forking ſometimes apears, as all of them meet with, when they have reached elow the ſtaple of the ſoil; and therefore many of them vercoming this greater reſiſtance, is an evidence that, when rong, they overcome impediments that ſtope them when eak.

I ſhall only add, that it is natural to expect, that carots raiſed in this manner, will be much freer from worms, nd much better every way, than thoſe raiſed in our garens, except ſuch as are ſown upon newly trenched ground, hich has indeed the ſame advantages, as cultivating them n the manner that has been deſcribed.

M. de Chateau Vieux obſerves, that the carrots he ultivated in this way had a more agreeable flavour, ere more tender, more delicate, and took up much leſs ime in boiling, than thoſe cultivated in the ordinary way n the kitchen garden. This he thinks is owing, not only o the making no uſe of dung, but alſo to the culture iven, by which they enjoy more of the rays of the ſun, re better expoſed to the air, and receive greater advanages from the dews.

Of the Culture of the Parſnip.

Some perſons may be poſſibly ſurpriſed to find, that the arſnip has a place here; and that it ſhould be propoſed o cultivate it in our fields. I know not indeed whether his has as yet been attempted in Scotland; but I am perſuaded that it may be done with great ſucceſs, and to very reat advantage.

It is ſaid, that in the iſland of Jerſey or Guernſey, they ave very extraordinary cow-milk and butter, and that heir cows are often fed with this root. It is a certain

thing

thing that it is very nouriſhing, and that both cows and ſwine are very fond of it.

The author of the foreign eſſays informs us, that in Bretagne when fodder is ſcarce, the cows eat nothing but parſnips, and that, when boiled, cattle eat them with aſtoniſhing greedineſs. *

When properly cultivated, the parſnip grows to a very large ſize, ſo that as large a crop of it may be expected as of turnip. Its roots are much ſtronger than thoſe of the carrot, and pierce much harder earth.

Theſe things ſhould engage ſome perſons to try to raiſe a crop of parſnips; for if, by the culture of this root, proper food can be provided for milk-cows in the winter ſeaſon, a very great improvement will be made, as the country will be provided with good milk, which in that ſeaſon is very much wanted.

The cole, the turnip, the cabbage, and the other things that have been tried for this purpoſe, have not ſucceeded; for tho' the cows feed very well upon them, yet they give the milk a diſagreeable flavour, and intirely ſpoil the butter that is made of it. If the parſnips, on the contrary, give the milk and butter an agreeable flavour, as is ſaid, the advantages ariſing from raiſing them muſt be very great.

The form of the root, and the manner of cultivating parſnips in the garden, point out to us that the ſame culture that ſucceeds with carrots will ſucceed alſo with them. But as the parſnip is a more hardy plant than the carrot, and its roots much ſtronger, it may be raiſed with leſs difficulty.

The author of the foreign eſſays propoſes a method of cultivating parſnips in the fields, communicated by M. le Brigant rector of Plouezoch in Bretagne. It is propoſed, that

* Foreign eſſays, art. XVIII. p. 146.

that they ſhall be ſown upon land that has been dunged the preceeding year, preferring that which has carried a good crop of barley; that the land ſhall be deep plowed, and brought into good tilth; that while the plough is at work, the earth at the bottom of the furrow ſhall be thrown on the plowed land; and that the field ſhall be divided into ridges 10 or 12 feet wide; that betwixt every ridge a trench ſhall be dug, and the earth thrown on the ridges on each ſide. This method is expenſive, but, to ballance this, the author promiſes a crop that ſhall yield three times as much profit as a crop of wheat, that gives a return of nine for one *; a very encouraging promiſe indeed, if it could be depended upon.

A trial in the horſe-hoeing way will be leſs expenſive, and perhaps as ſucceſsful. But before any perſon makes the attempt in either way, he may have a few raiſed in his garden, to ſupply a milk cow for a few days. By this trial, he may know if they are as proper as is ſaid, for this purpoſe; and being ſatisfied in this, he may then proceed in the attempt to raiſe them in the fields.

* Foreign eſſays, art. XVIII. p. 145. 147.

ARTICLE

ARTICLE LXI.

FARMERS KALENDAR.

SEPTEMBER.

Wheat.

IT has been found, by the practice of ſeveral counties, as well as from particular trials, that this month is the prime ſeaſon for wheat-ſowing. Sow the ſummer fallows in the firſt fortnight and the clover-lays in the ſecond; But let me however obſerve, that a September ſowing is not recommended to be practiſed at all events: Becauſe if the month proves very dry, it will be proper to ſtay till rain comes; but September ſcarcely ever paſſes without plenty of rain. It is in that reſpect a ſurer ſeaſon, on an average, than October.

In wheat ſowing, the firſt object is the ſeed: Of this there are ſo many ſorts, that it is very difficult to aſſert which is the beſt; but the white wheat, and the red Kentiſh, are reckoned the fineſt ſorts for producing the whiteſt flower: But in many of the clay and wet loamy countries in England, the farmers prefer what they call *great* wheat: In ſome places they term it *clog* wheat, in others *rivets*; but the true name, in common is, I believe, Bearded wheat. It ſells generally for about one ſhilling and ſixpence, or two ſhillings per quarter, leſs than the other ſorts; but, from its hardineſs, it more than pays this deficiency in a ſuperior produce.

In reſpect of preparing the ſeed, the uſe of ſteeps is now baniſhed, by common conſent; but it is proper to prepare it for other purpoſes. It is a good way to waſh it in fair

water

water ſeveral times; becauſe if any of it is ſmeared with the duſt of ſmooty or burnt wheat, you will thereby waſte off ſuch duſt, and have, according to the opinions of various perſons, the cleaner crop. But a more viſible uſe of waſhing is, to diſcover the light chaffy grains; for all that does not ſink quick to the bottom ſhould be ſkimmed away with a quick hand; by which means you are ſure of ſowing none but the ſoundeſt and weightieſt grain. Steeping or waſhing in ſtrong brines, or urine, has one good effect, tho' not a fructifying one, that of preſerving many of the grains from being eaten by the worms, grubs, &c. After ſteeping and waſhing, it is uſual to lay the wheat on a heap, and mix ſome ſalt with it, and then dry it with lime In dry ſeaſons, the ſalt is of uſe in attracting moiſture to the ſeed, and thereby making it ſprout the readier.

It is a diſpute in ſome parts of the kingdom, whether the wheat-land ſhould be plowed on to the broad, flat lands, or on narrow, round ridges; the firſt about a perch over, the latter three feet over; on the firſt the ſeed harrowed in; and on the ſecond plowed in, in forming the ridge. If land is apt to be very wet, or lies ſo that the water does not readily run off, the three feet round ridges are much to be preferred; becauſe every furrow is a drain, and, if the water furrows are well cut, not a drop of water can remain on the land; but on drier ſoils, or thoſe that have been well drained by under ground drains, the flat lands are better, being more equally cropped.

Two buſhels are the quantity uſually ſown on an acre of land; but it has of late been the faſhion to recommend a much ſmaller quantity.

A circumſtance of much importance in the culture of wheat, but oftentimes ſtrangely neglected, is water-furrowing: This work ſhould be well and effectually performed on all lands, except thoſe that are perfectly dry all winter through, and ſuch are ſeldom ſown with wheat. The water

ter furrows ſhould be plowed as ſoon as the field is finiſhed ſowing, plowing, &c. and then a ſpit ſhould be dug out from the bottom of them, and laid on one ſide oppoſite to the riſe of the land, and the looſe moulds ſhovelled out: The openings of all the furrows ſhould likewiſe be cleanſed, ſo that the water may have an eaſy fall out of every furrow into the water ones. The number of theſe muſt ever depend on the variations of the ſurface; the only general rule being to make them ſo numerous, that no water can ſtand on the land in the wetteſt weather. In bottoms of fields, or other places, where there is a double ſlope of the land, it is neceſſary to cut double water furrows, about a yard or four feet from each, to take water from each deſcent.

Wheat is often ſown on clover land, and it is the moſt profitable culture of that grain. In the plowing up the lay, a moſt excellent practice is, to trench plow it: That is, to let one plough go firſt, and take off a thin ſlice, about four inches deep, and then another plough in the ſame furrow, to get a further deepth of about three inches more, raiſing up the mould, and burying the turf with it: The ſurface then harrows fine, and the wheat has a bed of mould to lie in, inſtead of the furrows only of ſingle-plowed clover land.

Another culture of wheat, is to ſow it on a bean ſtubble, which is very good huſbandry, if the beans were kept in excellent order; but the land, unleſs they were drilled and horſe-hoed, will require three plowings; and conſequently it may be found adviſeable to defer the ſowing till October: But this month ſhould be made uſe of for the tillage. Soon after the beans are carted, the land ſhould receive the firſt plowing, and, before the expiration of the month, the ſecond ſhould be given.

Clover.

The ſecond crop of clover will not, in many ſoils, be ready to mow before the firſt week in this month. One great

great advantage of manuring land richly is to force the growth earlier: the ſhort days and heavy rains, common at this ſeaſon, are very unfavourable to hay making. As you may very probably find the inconvenience, and have your hay damaged, do not forget the remedy of ſalting it: Throw a peck of ſalt in the ſtacking to every load of damaged hay, and it will recover it well.

Such of the crops of clover as were fed, ſhould now be cleared for wheat ſowing: The ſwine in particular ſhould be turned from the clover into the woods for feeding on acorns and maſt. Attention of this ſort ſhould always be given, or the profit of a buſineſs muſt ſuffer.

Sheep.

This is the principal month in the year for ſtocking yourſelf with ſheep; and you ſhould therefore conſider well the nature of your farm, that you may fix upon that ſort, which are moſt likely to pay the beſt. The ſorts commonly bought are the following:

1. Stock ewes, young.
2. Ewe Lambs,
3. Two or three-year-old wethers.
4. Wether lambs.
5. Old ewes.

As to the breed*, it is a matter of great importance, that you buy an excellent *good* ſort, whatever your land; but the ſize muſt be proportioned to the food you have for them. If your ſoil is poor, light, ſandy land, with a very

* The Breeds are principally theſe:

1. Teeſwater.
2. Lincolnſhire
3. Dorſetſhire.
4. Wiltſhire.
5. Hertfordſhire.
6. Norfolk.
7. Welſh.
8. Moor-ſheep.

ſpare bite, the *Welſh*, *Moor*, or *Norfolk* ſheep will ſuit beſt. Such land can only keep a regular flock of ſtock ſheep, but never fat any. You ſhould therefore buy theſe hardy ſorts, and improve the breed by well bred tups, of a ſmall ſize. But remember in chuſing your tups, that no evil is ſo great on ſuch land, as a tender breed. Upon good ſoils, that afford plenty of excellent food, you muſt have recourſe to the larger breeds. The Teeſwater are the largeſt ſheep in England; but I do not think thoſe very large ſheep fit for any but the very richeſt paſtures worth from thirty to forty ſhillings an acre. The Lincolnſhire, though a leſs breed, muſt be ranked in the ſame claſs. For all middling lands, (for inſtance, from ten to twenty-five ſhillings an acre rent), the Hertfordſhire, Dorſetſhire, or Wiltſhire breeds, are preferable to any of the reſt: Theſe are all well made ſheep, and will riſe, with good management, to a very great value.

The firſt ſort of ſheep in the above table, viz. young ſtock ewes, are proper for theſe perſons, who deſign to keep a regular flock, for the three articles of profit, lamb, wool, and folding. A farmer, when he purchaſes ſtock of this ſort, ſhould conſider well his land, and take care to proportion the number, as well as he can, to the food he ſhall have for them. This is a very profitable application of inferior paſtures, of clover, ray-graſs, burnet, and common ſheep walks; alſo of uſing any right of commonage annexed to his farm; and he muſt alſo appropriate a certain quantity of turnips or cabbages for the winter maintainance of ſuch flock. Upon an average of crops, he ought to have 10 acres to every 100 ſheep, and a piece of burnet, or ray-graſs to take them in the ſpring. The folding buſineſs ſhould never ſtop with a flock of this ſort: In the depth of winter, it ſhould be carried on, either on dry gravelly paſtures, or under cover, on plenty of litter. Perhaps the profit of theſe ſheep ſuppoſing the ewes

ewes to be brought in at two years old, and to be worth 45 shillings, may be as follows:

Wool	L.	0	4 0
Lamb		0	10 0
Folding at leaſt		0	1 6
Total	L.	0	15 6

But this depends on the breed being, as I have ſaid, of the middling ſize, and of the beſt ſort; the Hertfordſhire, for inſtance.

The profit of the poorer ſorts, ſuch as the Norfolk breed, will not riſe to near this amount; they may be calculated as under.

Wool	L.	0	1 0
Lamb		0	7 6
Folding		0	1 0
	L.	0	9 6

Another method of managing young ewe ſheep is, to buy them in in *September*, to keep them upon the pooreſt lands of a farm till they lamb; then to draw them off to turnips or cabbages; not to eat as much as they pleaſe, but to bait them enough to keep them in good order; and in the following ſummer to ſell the lambs as ſoon as fat, and afterwards fat the ewes; getting ride of both within the year, from the time of buying in; the account may be ſtated thus,

Wool	L.	0	4 0
Couple		1	10 0
Folding about four months		0	0 6
	L.	1	14 6
Coſt of ewe		0	15 0
Profit		0	19 6

In

In this management, it is a matter of great importance to have the ewes lamb early, ſo that the lambs may be fat, and ready to ſell the beginning of May at fartheſt. If care is taken to have plenty of turnips, cabbages and early graſs, the profit on a good breed may be carried higher than this account. Fat graſs lambs are often ſold the beginning of May at 19 and 20 ſhillings a piece, of the beſt Hertfordſhire breed.

The ſecond ſort of ſheep, viz ewe lambs a year old, are in ſome places bought in, at this time of the year, to ſell fat by that time twelvemonth, after the lambs (fat) have been drawn by the butcher. This is but an indifferent conduct, much inferior to ſeveral other plans.

The purchaſing wethers of two or three years old, is a very profitable management. A good method is to buy them at this time, to keep them bare through the winter, only baited at turnips or cabbages; however, in good order enough to fold conſtantly on the dry graſs lands: To continue them on but indifferent food, folding till July; then to throw them into good graſs, and from thence to turnips; from turnips to cabbages, and not to ſell till *April* and *May*, when mutton is dearer than at any other time of the year. This account may be ſtated thus:

The wether fat		L. 1	7 0
Wool		0	5 0
Folding		0	1 6
		L. 1	13 6
Prime coſt		0	16 0
Profit		0	17 6

In this method, near the firſt year is paſſed for the folding, by which means you have a full folding ſtock all the

the year round; and it is obſerveable that the profit of that manuring, through I attempt partly to calculate it by way of proportioning the ſorts of ſheep, yet is it much more conſiderable than mentioned in any; and, in a long courſe of years, beyond all calculation. This flock of wether ſheep is very advantageous in one reſpect, which is their hardineſs, and their being little liable to accidents, not near ſo troubleſome in attendance in winter as ewes.

Wether lambs, a year old, are in ſome places the ſtock bought in at this time, and ſold fat in a twelve month from graſs, which is a profitable management.

Laſtly, comes the ſtock of old ewes; but this article muſt be explained. In the ſtock flocks that are never fattened, a varying number of the oldeſt ewes, are every year drawn out, ſold, and the ſame number of lambs kept in their ſtead. The rule of drawing the old ones, is the ſtate of their mouths. When their teeth fails, ſo that they cannot fare well on the ſheep walks, nor ſtand the fold, they pick them out, and, driving them to fairs at this time of the year, ſell them to the farmers who do not fold, and who buy to fat within the year on richer grounds: This is a very profitable management. The breeds are ſeldom good, as they come generally off of poor ſheep-walks: So the price is proportioned from five to ten ſhillings, about ſeven ſhillings and ſixpence an average: They are kept hard till they lamb, then are helped with ſome turnips, and well kept till the lambs are drawn off fat, after which the ewes fatten, and all are gone within thirteen months. The couples ſell in proportion to the firſt coſt; but if you have pretty good luck, you will treble it. If they coſt ſix pounds a ſcore, they will fetch eighteen pounds; This ſheep management is as profitable as any a farmer can fix on.

Fatting

Fatting beaſts.

You muſt now be very attentive to the ſtate of your fatting beaſts, and the remainder of your graſs. It is no uncommon thing to have food fall ſhort in this month: ſee therefore that your cattle do not ſtop for want. A beaſt that is nearly fat muſt have plenty; becauſe he is nice, and if he is at all curtailed in his paſture, will fall away. The middle of this month, there ſhould be a large breadth of mown ground untouched, ready to turn into; and ſome ſhould be quite freſh for them the very end of this month, to take the beaſt, and carry him pretty far into October.

Remember that beef is cheaper at Michaelmas, than at any time throughout the year; for all graſs-fed cattle are then at once brought to market: this ſhould give the attentive grazier an idea of varying, as much as poſſible, from the common method: to ſell only a part of his cattle at this time, only ſuch as are ſo fat, that they would be unprofitable to keep longer, and to put the reſt, when all the graſs is done, to turnips or cabbages.

Cows.

The dairy of cows muſt have plenty of graſs throughout this month, or their milk will be more apt to fail than at any other ſeaſon of the year. Lucerne, mown green, and given them in a yard, is the moſt profitable way of feeding: the product is ſo ſingular, and ſo little dependant on the ſeaſons, that it is a very matter to proportion the dairy to the plantation of it, and never be under a want of food; for lucerne, mown every day regularly, will carry them at leaſt to the third week in October; and, although ſome perſons have aſſerted, that cows will not give ſo much milk thus managed, as when they range at large, and feed how and where they will, yet it is not a matter of enquiry; becauſe,

cauſe, if they give but half as much, that half will aſſuredly pay more clear profit, than all in the other caſe: there may be ſome inferiority; but the cows are kept on ſo trifling a quantity of land, that there remains not any compariſon between the methods, for profit.

The Teams.

Theſe muſt be kept at work cloſe, or let the farmer remember he loſes money by them. Wheat-ſowing is one of thoſe works, in which we uſually ſtretch a point, and make the ploughs do a quarter of an acre each extraordinary. Both horſes and oxen ſhould be kept this month to lucerne, mown every day: they will work as well on it as any other food; but, while they plow, they muſt now have oats and chaff with it: for no graſs, at this ſeaſon of the year, is ſo nouriſhing as it was in the ſummer.

Manure Graſs.

Graſs lands ſhould be always manured with compoſts, and never with dung alone, for many reaſons: dung ſhould never be kept until it is ſo rotten, that it will waſh into turf; becauſe by that time, it loſes its virtue at a great rate, and, while in full fermentation, it is of ſuch great utility to arable land, that a greater profit will ſo ariſe from it, than by laying it on to graſs. Beſides, there are many ſuccedaneums for dung, or at leaſt, for making it go much further on graſs, than on arable: The proper compoſts are chalk, clay, turf, ditch-earth, pond mud, lime, aſhes, ſoot, with ſome dung; all, or ſome of theſe mixed together twice in a twelvemonth, will be in excellent order for ſpreading on graſs lands, and will be highly ſufficient to keep them in great heart, with but a ſmall quantity of dung. This is the proper ſeaſon for carrying ſuch compoſts on: lay about 15 or 20 loads an acre, not more. It is difficult to

over-

over-manure arable lands, but very eaſily done with graſs; becauſe large quantities do not waſh in quick enough. Let the compoſt heaps be ſpread very regularly, which is much more neceſſary than on arable. A good farmer will manage to give his paſtures, unleſs they are very rich, a dreſſing of compoſt every two years.

Scarify Graſs Lands.

Scarifying graſs is a new practice of ſome ingenious gentlemen, but not yet become common huſbandry. It conſiſts in cutting the turf with a plough, of nothing but coulter, or with a plowing harrow: ſo that the ſurface may all be cut or torn; this operation is on principles directly contrary to the common idea of rolling in Autumn, which is done with deſign, not only of levelling for the ſcythe, but alſo of preſſing the ſurface as much as poſſible, for which the heavieſt rollers are choſen, until ſome are worked, that require ſix or eight cattle to draw.

If there is any fault in the nature of turf, which prevents the ground yielding crops proportioned to its fertility, it is the ſurface being ſo bound by the net-work of roots, which are matted through it, to the excluſion almoſt of the influences of the atmoſphere. Now rolling increaſes this evil; the more you compreſs the ſoil, the leſs paſture will the roots have: But ſcarify it, tear it well in pieces, you in fact horſe-hoe your graſs, and give the roots looſe earth to ſhoot into; but if your deſign is to manure, this argument is yet ſtronger; for after the ſurface is ſcarified, the compoſt being ſpread, much of it will at once fall into the furrows of the teeth or coulters, and conſequently be immediately depoſited, where you would wiſh, at the roots of the graſs. Every one knows in general, the trouble and difficulty of getting manure into graſs land; how many times you muſt harrow, bruſh-harrow and roll, before it diſ-

appears

appears, and at laſt the effect is very partial; for but a ſmall quantity gets to the roots. Half this labour, after ſcarifying, would do it far better.

But here let it be obſerved, that there is an effect of rolling ſo viſible, that it cannot be diſputed, which is, the bringing a finer blade of graſs, and giving a better winter verdure, partly owing, however, to the levelling the worm-caſts, which being of a different colour, their diſappearing, of courſe, makes the green ſtill greener: for lawns, in ſight of a houſe, therefore, the more you roll the better; but not for a great product of hay.

Fern.

Now is the proper time to cut fern, called in ſome places, brakes and brakens. This is moſt profitable work, and ſhould never be neglected. Carry it into your farm-yard, and build large ſtalks of it for cutting down through the winter, as faſt as the cattle will tread it into dung; alſo for littering the ſtables, ox-houſes, cow-houſes, hog-ſties, fatting-ſheds, &c. &c. By having great plenty of it, you will be able to raiſe immenſe quantities of dung, which is the foundation of all good huſbandry; and it is well known, that no vegetable yields ſuch a quantity of ſalts as fern; from which we are to conclude, that it is beſt adapted to the making manure. The good farmer, in this work of bringing fern, ſhould not confine himſelf to his own waſtes, of which he may have none; but purchaſe it of his neighbours, if they are within a tolerable diſtance. It will anſwer exceedingly well: He need not therefore fear paying for it, as for refuſe ſtraw.

Stubble.

This month is the proper time for chopping the wheat and rye-ſtubbles, and raking into heaps, for carting home to the farm-yard for litter, upon the ſame principles, as

fern is carted there. This is a buſineſs ſtrangely neglected in moſt parts of the kingdom; but is nevertheleſs of very great importance: The ſtubble left on the land is of no advantage as a manure; but it prevents the plough from turning in the land with any tolerable neatneſs, and if the quantity is conſiderable, it will be ſuch an obſtruction, that no plough can perform its office at all; but carted into the farm-yard, it becomes an excellent manure. Any ſort of litter there is valuable, and ſerves for the cattle treading into dung. In thoſe parts of the kingdom, where this uſe of ſtubble is common, the price for chopping and raking into heaps, is from one ſhilling and fourpence to one ſhilling and eight pence per acre: a very ſmall expence, compared with the great advantages that undoubtedly reſult from it.

Plough Fallows.

Now let your ploughs turn up all ſorts of ſtubbles: This is one of the material parts of huſbandry, in which the common farmers are greatly wanting: They form very miſtaken ideas of this part of huſbandry, ſuffering their lands deſigned for fallows, and ſome even for ſpring crops, to remain till after barley ſowing, before they break them up. The principal reaſon they give for this conduct is, the benefit of feeding them with ſheep. As to the point of the land being better or worſe for its expoſure to the atmoſphere during the winter, it comes not at all into their enquiry; for they comprehend nothing of the matter. But let the attentive huſbandman, who does not give up all his ideas of common ſenſe, in compliance with the old cuſtoms of his brethren, conſider a little before he leaves his fallows till the ſpring before plowing. He muſt be ſenſible, that the air at all ſeaſons, eſpecially in froſty weather, pulverizes the clods. In the middle of ſummer, when the land is hard baked, ſuch an effect may be doubted; but if you ſtay till

rain

rain comes, and ſucceeding various weather, the fact will be ſufficiently clear. Now the farmer ſhould conſider, that pulverization of his land in winter is alone a matter of conſequence; becauſe it is a ſure method of making the weeds grow; and let them ever remember, that they cannot kill weeds, if they do not grow. If the fallows are plowed up in this month, and left well water-furrowed till March or April, they will by that time be covered with weeds: The firſt ſpring plowing deſtroys all theſe. Can any one think it a matter of little conſequence to effect this? Every ſeed that vegetated in conſequence of the autumnal plowing, would have remained ſafe locked up in the land, until the ſpring plowing, and then if any crop is ſown, it is ſure to be full of thoſe weeds, which an autumnal plowing would have raiſed, and the ſeed-earth deſtroyed. To kill weeds, they muſt be made to grow, and, when once they are above ground, a plowing deſtroys them: So that, if a farmer breaks up his ſtubbles in this month, and ſows on one ſpring earth, he kills all weeds that have ſprouted, at the ſame time, that he plows for the crop; all which weeds would have grown up with his crop, had he ſowed it only on the plowing.

With the fields deſigned for fallows, the caſe is pretty nearly the ſame; plowing at this time of the year has the effect of making the ſeeds of weeds vegetate: ſo that ſuch of them as ſurvive the winter, are deſtroyed by the firſt ſpring plowing; this gives the farmer an opportunity of harrowing after that earth, and leaving the land for ſix weeks for another crop to come up, which, like the former, is deſtroyed by the next plowing: Thus the autumnal tillage is abſolutely requiſite, for the mere work of killing weeds, without recurring to the attraction of any beneficial particles from the air.

The latter effect may appear very equivocal to a common farmer, never uſed to conſider things deeper than firſt appearances.

appearances. Unhappily this is a part of huſbandry on which we can only ſpeak from idea, and not in the leaſt from experiment. Of all the volumes that have been publiſhed on huſbandry, none gives one a clear proof of the acquiſition of manure from the atmoſphere: the benefit of fallowing is no clear proof; becauſe it is never experienced excluſively of killing weeds, and, unleſs ſuch effects were known diſtinctly, one cannot, with any preciſion, attribute a certain degree to each. As experiment has not, and probably will not, prove this important point, it remains for the diſquiſition of reaſon alone, which may adopt whatever ideas appear moſt juſt to individuals. There are many arguments to be produced, to ſhew, that the great benefit of fallowing, at whatever ſeaſon, is the deſtruction of weeds, and mere pulverization, without any reference to ſuppoſed acquiſitions from the air: a ſtrong one is the equality of crops, that ſucceed complete fallows, and other crops: the latter, if ſufficient care has been taken to deſtroy the weeds, are generally as good as ſuch as follow complete ſummer fallows. Wheat, for inſtance, after beans well hand-hoed is as good: after peaſe, if a great crop, the ſame without any hand-hoeing at all; after clover alſo, in which the land is bound, and matted together with roots: And the great fertility of new broken-up graſs lands, ſhould look, as if the very contrary ſtate to fallowed lands was moſt beneficial. Many writers talk of the great benefit of thick ſhade, and the putrid fermentation of thick and luxuriant crops. It may all bevery true; but ſurely the whole is founded on principles extremely different from the acquiſition of aerial benefit by fallowing! I know of none in which they agree, but the killing weeds.

The acquiſition of nitre, ſay ſome, is well known to be greatly effected by land being plowed on to the ridge in winter: and nitre, ſay others, is the principle of vegetation. This fact, of nitre being ſo very beneficial, ſeems rather to be a deduction of reaſon, than an experimental proof

proof. Salt-petre, in every application, has often been proved rather poiſonous than beneficial. Why, therefore, ſhould we ſuppoſe it of ſuch coneſequence in the air? I am by no means aſſerting the contrary, but only expreſſing doubts of thoſe maxims, which do not ſeem to have had experiment for their foundation. Let us, for theſe various reaſons, be contented with recommending autumnal plowing to the huſbandman, on principles that he can underſtand, and effects which are viſible to him, pulverization, and the killing of weeds: And not perſuade them to the practice; for reaſons, which are *Greek* and *Hebrew* to them.

Water-furrowing.

See this article in our Firſt Volume, page 161

Lucern.

Your drilled or tranſplanted lucern will yield another cutting probably this month; but, at furtheſt, the firſt week in October; after which cutting the ſucceeding ſhort growth is no object; but if it is cut the beginning or middle of this month, the caſe is different, for you will have another the end of October. But, when ever you take the laſt, make it a rule to manure the whole plantation from the compoſt dunghill; chalk, marl, turf, rotten dung, aſhes, ſoot, lime, malt duſt, &c. &c. will make a very rich mixture for it, and as it is done every year a ſmall quantity at a time will be preferable: For inſtance, twelve large loads an acre. As ſoon as the manure is ſpread equally over the ground, ſend in the common ploughs; and if the lucern is drilled in ſingle rows, go about in each interval, opening the land in the middle of it, and throwing a ridge over each row; by which operation the whole field will look like a fallow one, in ridges under which are the rows. And it has this great advantage, that all the manure

manure is gathered exactly up, and depoſited on the plants, being at the ſame time covered in from the weather, and each furrow is a drain; ſo that, if the water-furrows in the field are well opened, not a drop of water can any where lodge. The firſt dry weather after February in the ſpring, the ridges muſt be ſeveral times harrowed acroſs, enough to level the whole field, and ſo left for the young ſhoots to come through.

Let the cultivator of lucern remember, that one acre, managed in this complete manner will pay him better than many conducted in the method but too common. It may appear a ſpecies of extravagance to manure a crop every year; but lucern requires much manure: It will on good land, yield very beneficial crops without any; but to be carried to the higheſt perfection, not only of *product*, but alſo of *clear profit*, it muſt have great plenty of rich manure. Lucern has been carried to a product of above forty pounds per acre *per annumn*; but it was by being planted in a piece of ground as rich as a dung-hill.

ARTICLE LXI.

On the Culture of Coleſeed; By ARTHUR YOUNG Eſq;

[*Continued from our laſt* p. 460.]

ADDITIONAL REMARKS.

COLESEED, is one of the moſt profitable common crops known in England; it may be therefore thought ſomewhat extraordinary that a premium ſhould be adjudged to a paper proving it good for nothing. Theſe circumſtances, apparently jaring ones, requires a word or two in explanation.

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The Society did not demand *in general* an account of the moſt profitable culture of the coleſeed, but expreſsly tied down the candidates, by adding the condition, *for feeding cattle and ſheep.* Thus was the culture of coleſeed in general, and the ſpecified application, two things, abſolutely different.

Coleſeed, I have ſaid, is a moſt profitable crop.———It is ſo: but not for feeding cattle; nor ſhould I have conceived that any perſons could have thought of comparing it with turnips in that light. The profit of the crop is the ſeed—which amounts to five times the value of any food for cattle that will ever be gained from it.

I have made enquiries in many parts of the kingdom concerning the culture; and I find, that the great object is every where the ſeed; that in moſt parts they have no idea of feeding it at all; and that in others where it is practiſed, they do it merely upon the ſame principle that wheat crops are fed off; the farmers are diſtreſſed for green food, and they turn their flocks into their wheat and coleſeed, (in many places abſolutely againſt their own judgment relative to the crop alone) not becauſe ſuch crops were ſown for the purpoſe, but their yielding food when the flock ſtarves.

Some very ſenſible farmers, long practiſed in the culture of coleſeed, with whom I have converſed on the ſubject, have aſſured me, that if it is fed when the food is wanted, that is after turnips are done, the crop of ſeed is vaſtly damaged by it; to a much greater amount than the value of the ſheep fed.

Some of them have told me, that they have fed off crops earlier, and they think the ſeed not the worſe. But this they mentioned as a doubt.

But if the plant be applied to the ſame uſe as turnips, and uſed at the ſame time, it is agreed throughout the kingdom that the culture is worthleſs, not producing near the quantity

quantity of food with that crop; nor paying in any reſpect ſo well.

Reſpecting the culture of coleſeed merely for food in April and May; that is, to ſucceed turnips, there is one ſtrong reaſon againſt it, which is its not producing a great weight of food per acre; I know both from my own and others experience, that the weight of food is trivial, compared to that of turnips and cabbages, &c. I will venture to ſay, not an eighth part. Conſequently much land muſt be appropriated to this uſe, and after the ſeaſon in queſtion, what crops of barley or oats will be gained? The ſowing will be in May; now it matters nothing to enquire into culture or any other circumſtances; it is clear enough that the Spring corn-crop is ruined by late ſowing. Hence ariſes the neceſſity of the Spring-food yielding a great quantity on a ſmall ſpace of land, that the farmer may experience this evil only in a ſmall degree; cabbages, which yield as much food on one acre, as ever coleſeed will on ſix, appear to come infinitely nearer the wiſhed for mark.

The importance of gaining a Spring food to ſucceed turnips is very great, and the kingdom is much indebted to the Society for giving this object their attention; but whatever may be the reſult, the point of a late ſowing of the Spring corn-crop ſhould never be forgotten; for if all or much of the barley and oat crops are ſown ſo late, vaſtly more will be loſt in one crop, than gained in the other. If therefore the food is an arable crop, it muſt be one that yields a great quantity per acre; and the beſt management in that caſe would be, to occupy a certain number of acres proportioned to the flock of ſheep every year; with the ſame plant. Suppoſe cabbages: one crop will be off juſt in time for getting the land ready to receive the plants of another.

Where buck-wheat is known, a late ſowing is no objection; but the plant is too confined an object to reaſon upon.

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Thus much on the diſtinction between the culture of coleſeed *in general*, and the application of it to feeding cattle *in particular*. They are different matters, which ſhould never be ſubſtituted, the one for the other——Another point to be mentioned here is, the offering *unſucceſsful* trials to the Society.

It may perhaps be ſaid, that premiums are offered for *improvements*, and not for accounts of bad huſbandry. But I beg leave to differ from this opinion. If premiums are offered for the culture of vegetables not univerſally profitable, ſurely there is as much utility in ſaying, *where the culture is pernicious*; as, *where it is beneficial?* We may be allowed to ſuppoſe, that ſo intelligent a Society would not offer premiums for a matter that *cannot* anſwer on any ſoil. But granting the ſpecified culture may anſwer on certain ſoils, is it not of uſe for every man to declare whether it is good or bad on his land? Is there not great utility in knowing, that coleſeed for inſtance will not do on wet loams? Other people farming ſuch ſoils are thereby kept from uſeleſs expences. It appears juſt as uſeful to ſay experimentally, that turnips will not do on my loams, as to aſſert that wheat will not do on my gravels. There cannot be a more futile idea than meaſuring the merit of experiments by their ſucceſs.——The Society annually offer gold medals for accounts of horſe-hoed barley and oats—Will thoſe medals never be adjudged until ſucceſsful experiments are ſent?

ARTICLE LXIII.

EVERY MAN his own VERMIN-KILLER;

Containing, The moſt effectual methods of deſtroying that miſchievous little animal the Rat; as alſo the Mouſe—Mole—Ant—Dore, or Black-clock—Worms—Snails—Graſshopper—Crows—Weaſel—Polecat—Stoat, and Fox.

By a Farmer, who made it his ſtudy for many Years.

MANKIND in general may think it extremely odd, for a man to ſit himſelf down to write on ſo trifling a ſubject as VERMIN; but when conſidered by thoſe who feel the bad effects of not deſtroying them, I flatter myſelf they will not think my time altogether thrown away.

We have had numberleſs treatiſes on this ſubject, moſt of which I have read, and followed their directions, but cannot ſay with ſuch ſucceſs as I could have wiſhed.

In a late publication the author ſays, "I ſhall lay down "a conciſe method to deſtroy all kinds of Vermin." The public, in my humble opinion, might as well read for their inſtruction the hiſtory of animals; for he has not given any method of deſtroying one half of what he has undertaken: Therefore, leſt I ſhould be thought guilty of the ſame error for the ſake of ſwelling the publication, I will endeavour to avoid thoſe vermin, which neither myſelf nor any other perſon could ever find a certain method of deſtroying.

The method that the nobility, gentlemen, farmers, &c. make uſe of, is, to ſend for a man, known in the country by the name of a Rat-catcher, to whom they pay a ſtipulated price for every Rat. The Rat-cacher by this method picks up a good living; for when not employed, his leiſure hours are taken up in catching Rats, or purchaſing them alive, which he keeps by him till ſent for again, and

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the morning after he has ſet his traps, he carries the live Rats with him in a bag, and impoſes upon his employer a certain number, perhaps not one of them taken in the traps the night before: therefore I would recommend to thoſe who employ theſe people, to ſee the head of every Rat cut off, elſe he may be aſſured of paying for one ſet of Rats brought to his houſe half a dozen of times. I have known the famous Gipſy Rat-catcher walk fifteen miles, after ſetting his traps in the night, to a man who uſed always to keep live Rats by him to harden his Ferrets, and borrow half a dozen of him for a week; nay, I have been told by his friend the Ferret-man, that he has known him put live Rats into the out-houſes of gentlemen (whom he knew would employ him) to breed, ſo that as ſoon as the firſt Rat was diſcovered, he was immediately ſent for, and as ſoon catched them, without reducing the number; nay perhaps he increaſed them; for his going to and fro gave him an opportunity of conveying more into the building heavy with young. There are ſo many tricks made uſe of by Rat-catchers, that it is almoſt a thing impoſſible to guard againſt them.

Some Rat-catchers have a method of ſtabbing Rats in thatch of barns, &c. at random with a long ſpear; if the thatch be old, it ſhakes down and the water lodges; if new, it leaves it ſo ſight that the rain forces its way through, and rots the under-work, therefore of bad conſequence. The only certain method is, to fix upon a board the trap hereafter mentioned, as near to the holes at the bottom of the thatch as poſſible, when the Rats may be as eaſily taken as upon the ground.

Of Rats.

We have in this iſland four ſorts; the Barn, Field, Water, and the Houſe-Rat.

The Barn-Rat is grey upon the back, and called by ſome the Norway, by others the Hanover; it is no matter from whence

whence they came; we are clearly convinced, to our ſorrow, that every part of the iſle is peſtered with them. This Rat will not only frequent barns, but ricks, ſewers, henhouſes, hog-ſties, under floors in houſes, behind wainſcots and cielings.

Of Field Rats.

They are of a brown grey caſt, about as large again as Mice; you will find them from October till May, by the ſhape of their holes, in the corn-fields, which is made round as if cut with an auger: When the farmer ſows his wheat, eſpecially upon one plowing, they will run from one end of the furrow to the other, and eat or carry away the greateſt part of the grain: They will likewiſe run along the drills of peas. You will often find in the hedge row adjoining the field where peas are ſown, a large quantity growing, as if the man who had the drilling of them had thrown them away, which is the place they lay up their ſtore in. I have known them carry peas the width of ten acres in an open field, which is near 160——, as if not able to carry them as far as the hedge, and what they left of theſe have grown as thick as poſſible for the circumference of three yards. It will be dangerous to leave traps in open fields, therefore in the canicular days, when the fields are commonly bare, put into their holes a few hemlock ſeeds, or mix up a little flower with honey, and a little ox-vomit till it comes to a paſte, which put into the holes, and it will immediately deſtroy all the Rats in the Field.

Of Water Rats.

They frequent rivers, banks, &c. I have known them burrow in banks like Rabbits, and to make good their flight, they always have an entrance to their houſes from land and water: They live upon vegetables, and are fond of young

young peas and clover; they may be taken wtth the ſame cage and bait as other Rats; only remember that the cage will not ſwim upon the ſurface, therefore it muſt be buoyed up with pieces of cork or wood, ſo that the holes may be within half an inch of the water. You may drive four ſticks into the water, and place the cage upon them, but be ſure to take care it ſtands firm: The ſhorteſt method would be, if you have not any poultry near the place, to mix up with the bait for other Rats a little Ox-vomit, which will deſtroy them as ſoon as they eat it.

Of Houſe Rats.

Theſe Rats are black, and frequent the cielings and wainſcots of houſes; in out-houſes you will find them under the ridge tiles, behind the rafters, &c. The place they frequent you will eaſily find by the blackneſs of the rafters they run upon; nay you may ſmell them: the cage and bait, hereafter mentioned, will ſoon take them; only obſerve to place the cage upon the rafter, &c. where they run: If too narrow, you muſt fix a board even with the rafter, to ſet the cage upon.

The method of deſtroying Rats.

Some make uſe of ſteel traps, others of wood traps, called Hutches, in which you are never certain of catching above one Rat at the ſame time, unleſs they ſhould happen to come in droves, and fight which ſhall get into the trap firſt; and for this reaſon, the Rat which touches the bridge, cauſes the trap to fall at both ends, and ſhuts his companions out; beſides, to this trap there hangs a great expence, for you muſt have a ſmall wire cage, to take the Rat from the hutch, if by chance you take two, which is five hundred to one againſt you; then you muſt have a larger wire cage to put the taken Rat into, or carry a pail of water with you

to

to drown him, which is not only tedious, but it keeps you too long in the place, which ought to be kept as private as poſſible; for Rats are as ſly as Foxes, and ought to be dealt with in a very gentle manner. The ſteel trap is ſo expoſed, that if you take a Rat, his cries will make the reſt ſo ſhy, that you will never catch another in the ſame place; beſides the common method of ſetting a ſteel trap, is to bait it with cheeſe, bacon, &c. then place it upon the ground where the Rats come. As I before mentioned that Rats are very ſly, the trap ſhould be diſguiſed with a little moſs, or ſomething of that kind, which is at hand, and nothing expoſed but the bait, or if that was covered it would be as well, for they can with eaſe ſmell it. Therefore, to be at a greater certainty, and ſave both expence and trouble, I recommend the following cage, which will anſwer three purpoſes, and hold a dozen or more at a time;

Let the wire-maker make a wire cage,
One Yard in length,
Eight inches high,
and Eleven inches wide,

with a * Fall at each end, and one on each ſide; the ſide falls muſt be made ſo as not to interfere with the ends, nor oppoſite each other. When the cage is compleat, let the carpenter make a very thin deal box, as a caſe for the cage, ſo near the exact bigneſs of it, that it may be taken in and out with difficulty, and againſt the falls of the wire cage, cut holes in the box; this method may appear odd to many,

* N. B. By a *Fall* is meant a wire door, hung at the top inſtead of the ſide, and the lower part of this door or *Fall*, ſhould have the wires extended a little in length, and pointed, which will prevent the rat from lifting it up with his noſe, ſo as to get out of the cage again.

ay, but a ſecond Rat will never enter a trap or cage, if he ſees another confined. A night or two before you intend catching, take the box only, bait it in the manner following, when you find they have eat the bait, put the wire cage into the box; be ſure you clean the box, leaſt any thing ſhould obſtruct the wire cage from going to the bottom of the box; then put a little of the bait into the cage. I would recommend a lock and key to the box, (for when traps are ſet, it moſt commonly excites people to be continually looking at them) for which you muſt have ſtaples and a padlock, as an inſide lock will prevent the wire-cage from filling the box in a proper manner; never waſh the inſide of the box; if the dung ſticks to prevent the wire cage going down properly, ſcrape it with a knife; when you take any Rats drown them in the wire-cage, and when it is dry put it into the box again.

Some may be provided with traps, and may not chooſe to purchaſe this wire-cage, which however is by much the beſt! They may bait them with the following paſte, and remember that whatever ſort of trap is made uſe of, ſhould be placed as ſecret as poſſible; round the trap ſhake ſtraw or fern, that the Rats may come in private; if you find any holes in Barns, &c. that go through into orchards, fields, &c. then take a red herring, tie a ſtring to the tail and draw it round the building, then through the hole to the place where the cage ſtands, and the Rats will run at it like a dog footing a hare; if you have any trap but the wire one, bait it with the herring as well as the paſte.

Receipt for the Bait.

Take three large ſpoonfuls of flower,
Three ſpoonfuls of grated white bread,
One ſpoonful of treacle,
Three drops of oil of carraways,
Three drops of oil of anniſeed,
Six drops of oil of red herring,
And mix them well together.

It will be proper to put this mixture into a baſon or pan, for paper will draw the virtue of the oils away.

When your cage or trap is ſet, it will be neceſſary to ſcent it with the following oils; for which purpoſe take a phial and put therein,

Half an ounce of oil of anniſeed,
Half an ounce of oil of rhodium,
Half an ounce of oil of carraways,
To which add two grains of muſk.

Then take a feather and rub round the hole of the trap or cage; when done put the feather into the inſide of the cage. This receipt will take all Rats excepting the Field-Rats, for which you have had a remedy given. Pleaſe to obſerve, that in whatever place you ſet your trap, to bait it likewiſe with the food you find the Rats deſtroy, ſuch as oats, wheat, barley, malt, guts, &c.

Of Mice.

We have five different ſorts; two of which differ only in colour, the Graſs-Mouſe, and the Black ſhrew-Mouſe, which are very harmleſs, and live upon vegetables.

The Houſe Mouſe

Is known by every one to be of a very devouring and naſty nature; the ſhorteſt remedy to deſtroy this vermin, is, to mix with the feed preſcribed for rats, hemlock ſeed beat as fine as poſſible, which ſet for them at night in a plate or flat pan, which you may take away in the morning; be ſure you move all eatables from the place where you ſet the feed; this method will immediately deſtroy all that feed upon it. Numbers there are who do not approve of any poiſonous mixture for fear of accidents; then you may take them alive with a cage made after the ſame manner as the rat-cage, only

nine inches long,
four ditto wide,
and three ditto high,

with a fall at each end, with a box as before deſcribed for rats, if in barns the rat cage will take them; the cage for mice muſt be ſet with as much care as for rats, which when done, if it can be avoided, let no one go into the place after you have ſet it.

The ſcenting oils may be uſed as mentioned for rats.

The Field-Mouſe

Is ſomething larger than the houſe-mouſe, with a red back; he will feed upon corn or fleſh, and is very pernicious to farmers and gardens; he will run along the drills of peaſe, and under the furrows of wheat land, ſowed upon one plowing, and deſtroy the greateſt part of the ſeed; in ſevere weather he will, if poſſible, get into houſes, and deſtroy every thing in his way.

The cage will take him, as before-mentioned for the houſe-mouſe. When you find holes, as if cut with an auger, in the gardens, mix up a little flower and honey with Ox-vomit, which put into the holes as low as poſſible, for fear any poultry ſhould get to it, and when the fields are cleared of the corn, in the canicular days, then do the ſame, and it will immediately deſtroy all Mice that feed upon it, or the rat-food with hemlock, or ox-vomit, will anſwer the ſame purpoſe.

The Mole.

This vermin is known too well to every inhabitant of this iſland, therefore it is needleſs to give a deſcription of it. The common method of taking the mole is with traps, but few know how to ſet them. The certain method is to find the angle where the mole runs, which preſs down with your

feet, and if in the morning you find the earth raiſed up again, there ſet your trap, and you will be certain to take him; when you have ſet the trap, be ſure you cover it and the hole which you broke up, well over, that no light may get into the angle, for the mole will certainly avoid the trap if it ſees the light. Numbers there are who imagine that a mole cannot ſee, which is a miſtaken notion, the eyes of the mole you will find upon the ſides of the head, about the ſize of the point of a large pin, appearing like a ſmall black ſpeck: To prove what I have here ſaid, whenever you find a ſheep (which is often the caſe) to have trod in the angle, you may obſerve, when the Mole comes next to run the angle, he will retire from the hole the ſheep made, and immediately turn the angle another way: Some will ſet a trap twice in a place, which is a wrong method, for the Mole, if poſſible, will avoid the place where another was killed. The Mole will heave the earth three times in the ſpace of twenty four hours, ſome people then make uſe of a ſpear.

I would adviſe the keeping of the Moles taken, for two or three days, till you think you have taken the greateſt part in the incloſed field; then cut them in three pieces, and put them into the angles as nigh the edge as poſſible, i. e. open the earth as if you was going to ſet a trap, and no more will enter the field while any ſmell remains in the dead pieces. It would be an endleſs piece of work for a farmer to take moles by traps upon his ouſide land in common fields, unleſs his neighbours would join with him; therefore the only method he can take, is wherever he finds an angle or hill, to clear the earth until he comes to the hole in which the mole runs, and put therein a piece of garlick, onion or leek, the ſmell of which will cauſe the mole to quit the earth as if amazed by ſome ſudden ſhock, when, if you watch the land, you may with great eaſe kill him. When

the

the farmer ſows his ſeed, before he harrows it in, ſow at each end of the acre, and the width of two furrows on each ſide, the ſeed of Palma Chriſti, as thin as poſſible, and no Mole will enter the ground on which it grows: If the water ſhould lie in the furrows, as is often the caſe, and ſometimes upon three or four yards from the water furrow, then ſow the ſeed at your diſcretion where you are certain it will grow.

The Mole breeds in the month of April, at which time farmers and gardeners ought to be very attentive, for by finding out where they breed, they may not only take the young but the old ones, which may be done in this manner: the hill thrown up will be as big as a buſhel, take a ſpade and dig round the hill a trench below the depth of the angle, ſtop the holes of the angles on the outſide of the trench, to prevent the Mole running; then dig him out with a ſpade; be careful when you dig the trench to ſhake the earth as little as poſſible.

Ants or Piſmires

Commonly aſſemble in mole-hills; they will deſtroy barley, rye, hemp-ſeed, lintſeed, and rape-ſeed; other grain is either too large, double-ſkinned, or too bitter: When you find them in quanities near home, pour hot water upon them. The farmer when he dungs his land, if he uſes aſhes, lime, or ſalt ſand, he may be certain no Ant will ever ſtay upon the ground where any of the three is ſpread.

Dores or Black-clocks

Will deſtroy corn before it ſhoots, after which it will leave it. They do the farmer double injury, for they are not ſatisfied with deſtroying the grain, but will pick out the fulleſt and beſt corn. The burning of couch, or any other weed that will cauſe a ſmoak upon the land, will drive them away; or if you ſow ſharp lime with the grain, the ſmell will

will affect them, that if they eat the grain that has touched the lime, it will immediately deſtroy them.

Worms

Are the next deſtroyer of all kinds of grain; for they take it when the Dore or Black-clock quits it, which is at the ſprouting, when the ground hath rotted it, and the milky ſubſtance is breaking open the upper huſk, it ſhooteth forth in little white threads at both ends; then the Worm feedeth extremely, and ſo by devouring the ſubſtance, it prevents its growing out of the earth. Worms may be called the citizens within the earth; they are innumerable; and the loſs ſuſtained by them is infinite.

Before the farmer ſows his corn, let him take ſome hemp, boil it in water, and after it has ſtood for four hours, ſprinkle the grain before he ſows it, and no Worm will touch it. The ſmoak of ox-dung mixt with ſtraw, and burnt upon the lands, will deſtroy all the Worms within the depth of the plough: pleaſe to obſerve, that all fires made upon the land ſhould be lighted in the evening, when clouds bid fair for rain, then the ſmoak will fall upon the earth.

Snails

Will devour the grain, like the Worms, in the milk, feeding upon the tender white threads which ſhoot from the ſeed, and would riſe above the earth, being the ſtalk on which the ears ſhould grow, were it not devoured by the Snail as ſoon as it breaks through the earth, for they ſuck the tender ſweetneſs, and deprive it both of nouriſhment and life. About three weeks after you have ſowed your grain, I mean that which lieth long in the ground, ſuch as wheat, &c. ſow ſoot as thin as poſſible, and no Snail will come nigh it. In France they ſprinkle the lees of common oil over the land, which prevents all ſuch vermin coming nigh it.

Graſshoppers.

Graſshoppers.

Some parts of England are much peſtered with them: They, like the Snails, deſtroy the grain after it is ſprouted. Some people have a notion they do no harm, but if the farmer will examine his corn, he may ſoon be convinced to the contrary; for where they have fed, the ears of the corn will be withered and lean, the grain dry and blaſted, and no better than chaff; they will feed upon all kind of grain. When the farmer finds them upon his land, his only method will be to boil wormwood, or centuary, in water for two hours; then before ſun-riſe or after ſun-ſet, with a whiſk, ſprinkle the corn when juſt out of the ground with it; any bitter concoction will anſwer the ſame end, the Graſshopper being an enemy to any thing bitter.

When we conſider well the many obſtructions and diſadvantages the farmer lyes under, through the innumerable quantity of inſects and vermin which the corn is liable to be deſtroyed by, when firſt ſowed, after it is in the ground, when it firſt appears above the earth, while in ear, (perhaps you may add a blight,) when ripe by the winged race, and when in the barn by Rats, &c. I ſay, when we conſider theſe things, for my part I really wonder we have any corn brought to market.

Nay, we have birds which are not ſatisfied with deſtroying the corn at one particular time, for they devour it at three different ſeaſons; when firſt ſowed, when it appears above ground, and when ripe; yet ſome farmers ſay they do good; I grant it, they do, when they can be kept to eat Worms only; theſe are the Crows.

Crows [Vol. I. p. 229. 349. 608.]

Are worſe than Tithe-men, as they take their tithes at three different times a year for every acre of land. Some have

have a method of taking them with a pin crooked and run through Peas, or they keep boys to hallow; but boys are apt to ſleep and play, and the neglecting of the land one hour, will give the Crows an opportunity of doing more miſchief than the boy will do good in twelve months. I recommend the ſetting of different coloured feathers in a ring about five yards in circumference, in three different parts of the land, and no Crow will come nigh the place. Field-keepers are neceſſary juſt before the corn cometh ripe; gunpowder at no other time is of any ſervice, unleſs you add ſhot and kill them, but ſome have a notion that Crows are ſhy of powder, and tell you they can ſmell it; and to ſhew how far this notion will carry a man—I remember, in the year 1769, that I met a farmer of Middleſex, dreſſed in his ſhort coat, with every thing neceſſary for a day's ſhooting, going only to fire at Crows; I walked with him, and when I came to the field, I found it ſowed with marrowfat peaſe, upon which was ſtuck numberleſs ſticks ornamented with rags that had been white, which the farmer had changed the colour of by daily firing; I enquired the reaſon of his firing at the rags; he told me, that the linen held the ſmell of the powder for a long time, and that no Crow would come nigh the field whilſt the ſmell remained; but alas! how miſtaken was the farmer; for when the peaſe came up, he found that half the field was deſtroyed: And to prove how he waſted his time, and that Crows have no objection to powder, (though if you walk with a gun they appear ſhy, but that is from your ſneaking after them), if you ride on horſe-back with a gun in your hand, you may come within ten yards of them; Crows building in trees over the powder-mills, which are continually blowing up, is a convincing proof to me, that powder hath no effect upon them, for the blowing up of the mills not only ſhakes the earth, but ſcents the air for half a mile round. When farmers

farmers are peſtered with Rooks, as Gentlemen keep Rookeries for the ſake of hearing a continual noiſe, without the leaſt benefit, and will not deſtroy them, after repeated complaints, then the farmer muſt take care of himſelf, for he may be certain the gentleman will not pay his rent, though his Rookery may in great meaſure have ruined him; I would then recommend a pound of arſnick beat fine in leather, put it into a tin pot or kettle with half a buſhel of barley, or a ſmaller quantity of each; if your kettle is not large enough, when ſoaked a night take the barley down into the field the next morning, when you go to dung carts, and round every heap ſcatter a little barley, the Crows will follow the cart, and by the time they have eat it two minutes, you will find them tumbling in the air, and will pitch down as if ſhot; ſome will be ſo ſtrong as to reach the Rookery, but they will die ſoon after, and the next day you will find them under the trees in a ſtate of putrefaction; by this method, in leſs than a week, you may deſtroy a Rookery at the expence of two Shillings.

We have a number of winged vermin, which alſo peſter the farmer, ſuch as Hawks of many different kinds, Magpies, Buzzards, Kites, &c. The only method that can be taken is to ſhoot them, which you may with eaſe do by ſtaking a chicken by the leg in your orchard, hide yourſelf within gun ſhot, and juſt before he ſtrikes ſhoot him; a ſteel trap, baited with a Rat, Chicken, or whatever you find them devour, will take them.

The Weaſel

Is ſomething of the Ferret kind, but ſmaller; it will deſtroy Rabbits, Chickens, young Ducks, and ſuck eggs; you may always know when a Weazel has deſtroyed your Chickens, or ſucked your eggs, for they always leave the carcaſs and ſhell behind them. You may ſet the common hutch

trap,

trap, baited with a dead Chicken, or what they deſtroyed laſt, and you will be ſure of taking him.

The Polecat, Fitchat, Fitchew, or Formet.

The ſame animal called by different Names in different Countries; he is of a miſchievous nature, will get into hen-houſes, and deſtroy Chickens, Ducks, &c. and if poſſible carry them away. The beſt method to take him, will be with a ſteel trap; obſerve well the way he gets into the hen-houſe, and at the hole place the trap, which cover over with earth as light as poſſible; be ſure you place it ſo that he muſt go over it to get into the hen-houſe, which do at noon, that the earth may not ſmell of your hand, and to prevent any thing elſe from being caught in it, lay a piece of ſlit deal over the trap, which take off when you go to bed; you muſt either watch the trap, or riſe before the poultry in the morning to prevent them falling into the ſnare; if you do not catch him the firſt night, cover the trap over as before-mentioned; if you have not a ſteel trap, the common hutch will take him, baited with a Chicken, Duck, &c.

The Stoat

Of all ſmall animals is the worſt; he will run through a whole brood of Chickens in a little time; he will deſtroy Hares, Rabbits, Pheaſants, &c. his method is to catch them by the neck, and ſuck them to death. I have heard a Warriner ſay, (the truth I will leave my reader to judge) that he has often found Stoats hanging to the neck of both Hares and Rabbits, and have ſhot them with great eaſe while running. If you ſet the hutch trap, baited with any thing he laſt deſtroyed, and place it under a wall or pales, where they run in the night, you may take the Stoat; but obſerve when you ſet the hutch, to place a board from each end

end of it ſlanting, ſo that the end fartheſt from the hutch may be two yards from the wall; thorns, or any thing of that kind, will anſwer the end, if laid properly, for the Stoat will avoid a trap only by going a little out of the way, but this method will lead him in by degrees.

The Fox.

This animal is ſo ſly as to avoid almoſt every thing that is ſet for him; when the farmer finds he frequents his yards, the beſt method will be to examine well which way he comes; if you are in a doubt, take ſome ſand and ſhake it lightly upon the ground, and in the morning you will find the impreſſion of his feet; there ſet a ſteel trap, without any bait, cover it lightly over with earth, which take up with a ſpade, leaſt he ſhould ſmell your hand, and ſift it over the trap; this you muſt do in the evening, when every thing elſe is gone to reſt, leaſt they ſhould be taken in it: If you do not catch him the firſt night, lay a piece of ſlit deal over the trap to prevent any thing elſe getting nigh it; if you find him ſhy, take a little flower and honey mixt with the blood of any fowl or ſheep, add ox-vomit or hemlock ſeed bruiſed fine, which make up in balls, and place it in three or four different parts of your orchard or yard where he comes, and it will immediately deſtroy him. You muſt be careful how, when, and where you put this mixture, for it will deſtroy every thing that feeds upon it; for which reaſon you muſt lay it late at night, and take it up before Sun-riſe in the morning.

ARTICLE LXIV.

ABRIDGEMENT of HUSBANDRY ANATOMISED: By JAMES DONALDSON.

[Continued from our laſt, p. 476.]

CHAP. IV.

Of the Profit and advantage of Hedging and Incloſures.

AS heat is one principal inſtrument of the growth of grain and other produce of the earth, the promoting it ought to be principally attended to. That is done two ways; firſt, by reſtraining external cold; and next, by ſtrengthening and aſſiſting the natural heat of the earth.

External cold is reſtrained in a ſpecial manner by planting and hedging. From experience we may obſerve, that where the earth is ſheltered from the violence of ſtorms, as in an orchard or garden incloſed, or under the ſhelter of trees, it is more fertile than other ground alike in every other circumſtance, this only excepted: Or even where there is a buſh, or any inſignificant ſhelter in an open field, the corn or graſs that grows under the lee of it will be much preferable to the reſt. On the other hand, we may obſerve, where the wind has a paſſage through the gap of a hedge or ſtone-wall, the corn or graſs oppoſite to it is much inferior to the reſt of the field. Numberleſs inſtances may be given to confirm this; ſo that we may ſafely conclude, that hedging and planting is an effectual method of reſtraining external cold.

The natural heat of the earth is ſtrengthened and aſſiſted by the application of dung or manures; of which I have ſpoken in the ſecond Chapter: The application of theſe, will ſo warm and heat the earth, that it will produce grain

and

and graſs without any fence: But where there is no fence or ſhelter from ſtorms, the earth requires a greater quantity of dung to keep it warm: But where the earth is defended from ſtorms, the leſs dung will ſerve. And ſeeing manure cannot be had to every piece of ground, theſe fields that are fenced will not require ſo much; and ſo what can be had will ſerve the more. Wherefore, if, in the inſtance formerly given, four acres and a half was dunged every year by the dung of the cattle that were maintained upon the farm of 90 acres, we may well ſuppoſe, that where the ground is hedged or fenced, the ſame quantity of dung will manure one acre more every year.

Now, if one acre more can be manured every year, and the manure laſting four years, then four acres more corn may be had every year; which being reckoned at ſeven bolls per acre, the produce formerly ſuppoſed, makes twenty-eight bolls more than before the farm was incloſed. But as four acres of that which formerly lay in graſs is now made into corn, it may be ſaid that the profit is inconſiderable, ſeeing four acres of graſs are deduced for theſe twenty-eight bolls of corn: To which I anſwer, that as the whole ground is incloſed and warmed by hedging, ſo that the corn-land yields as good crops now when a fourth or fifth part of the dung is ſaved, as when it had the whole allowance before it was incloſed, we may by parity of reaſon conclude, that the graſs will alſo be a fourth or fifth part better than before it was encloſed; ſo that the 44 acres of graſs remaining will be greatly better than the whole 48 were formerly; yea, that though ten acres were taken off, the remaining 38 acres will yield more graſs than the whole did when it lay open.

Beſides the twenty-eight bolls additional produce on the croft-land, we may ſuppoſe that the outfield, when incloſed, will yield a boll per acre more than it did formerly: However, reckoning it at half a boll only, that is eleven bolls from the twenty two acres, which, added to the twenty

eight

eight bolls from the croft-land, makes thirty nine bolls; and this at L. 5 per boll, is L. 195 more than the produce of this farm was formerly reckoned at.

The yearly expence is no more than we formerly reckoned, excepting the ſeed and labouring of theſe additional four acres taken off the outfield, for which we may allow L. 12 per acre.

From the produce of	L. 195 0 0
Deduce ſeed and labour of 4 acres at L. 12	48 0 0
There ſtill remains	L. 147 0 0

And in reſpect that the paſture ground is as much improven by hedging as the corn-land is, a greater number of cattle may be maintained on it; conſequently more dung will be made, and a further profit will alſo be made on the cattle themſelves.

But I proceed to propoſe another ſtep of improvement on this farm, in two ways; firſt, by fallowing; and ſecondly, by encreaſing the quantity of manure.

The outfield was divided into three parts, whereof one third was propoſed to be always in corn, and two thirds in graſs. If the ground lye conveniently, I would ſubdivide each third part into three, and plow one of them, that is, about ſix or ſeven acres every year. If that cannot be conveniently done, I let it lye till the third year, and then I fallow ſix or eight acres of it ſome time in winter. About the end of April or beginning of May, I plow it over again, and let it take the drought for a month or more, then harrow it, and let it lye a week or two; after which I give it a third plowing; and after lying as before, and when the mould is again dried, I harrow it again. The advantage of this kind of labour is greater than can be well credited by thoſe who know not ſomething of it by experience: For firſt, by this frequent tilling and harrowing, the ground is made mellow and tender; Secondly, all weeds, and graſs that may extract the ſtrength of the ground is conſumed; and by the by, I know of no better way to clean the ground

of

of that pernicious weed called Goole. Thirdly, It receives great benefit by the warmneſs of the ſun-beams, by which it becomes thoroughly dried in ſummer, and thereby continues much warmer through the winter than otherways it would be. And, laſtly, the dew and rain falling upon the earth, contributes to its fertility, from the ſalt quality which they bring along with them, and which remains with it, as it is not exhauſted by any kind of plants growing upon it. And to confirm theſe arguments, let our farmers only conſider, what is the effect of fold dykes; Theſe, though made of the next adjacent earth, yet after being expoſed to the ſun and wind, rain and dews for a ſummer, and again, thrown down and ſpread on the place from whence it was ſpread, contribute to enrich it, and make it much more fertile than the other grounds that were not ſo dug up and dried.

The ſecond point propoſed is, to encreaſe the manure of the farm. For this end, I preſerve the dung of the cattle, by bordering the dunghill round with a wall of earth, ſo that no ſap may run from it; and I alſo take care that none of the urine of the cattle run away or be loſt; for doubtleſs, there is as much ſtrength in the urine as in the dung: And if there is not as much off-fallings of ſtraw or litter about them as may retain it, it ſhould be preſerved in a trough or deep hole at the lower end of the cow-houſe or ſtable, and carried from thence, and poured from time to time on the dunghill. If there be any marle or ſea-ware on the ground, or any place near by, as much of it ſhould be procured every year, and laid upon the ground, till it be all gone over. But if neither of theſe can be had, and lime can be got, it muſt not be omitted; that ſhould be mixed up with the dung, ſtraw, old thatch of houſes, clay, turf digged in ſome moſt convenient part of the farm and dried, and all other kind of rubbiſh that can be procured, and a dung-hill thereof formed upon ſome convenient

convenient part of the ground that is to be fallowed. This ſhould be the ſummer's work, and always when occaſion ſerves. At the end of three years, when this ſix or eight acres field is fallowed, this dunghill ſhould be ſpread out upon it: But if the ground is ſo ſituated that two or three acres can be fallowed every year, theſe acres ſhould be manured with this compoſt regularly in their courſe.

After fallowing and manuring in the manner before preſcribed, the ground ſhould be plowed about Michaelmas, and ſown either with wheat, rye, or winter-barley: And if the ſeaſon prove favourable, ten or twelve bolls per acre may be expected without a miracle: For fallowing of itſelf, without any manure, will enrich any ordinary ground, ſo that for three or four years it will bear as much as if it had been dunged tolerably well: But this ground having never been manured before, and receiving now both a compleat fallowing and manuring, it is brought at once into excellent condition; and being plowed but three years and reſting ſix, with the benefit it receives from the hedging by being kept warm, it will be in excellent condition; and if only two or three acres of the outfield is treated in this manner, in twenty or twenty-four years the whole outfield will be gone over, and brought to as good condition as any part of the crofting: So that from thenceforth, it need not lye more than three or four years at a time, and be plowed as long; whereby there will be eight or ten acres more in corn, than was formerly ſuppoſed; and each of theſe acres may reaſonably be ſuppoſed to bring ſix bolls yearly, which is two bolls more on each acre of the twenty-two acres of outfield propoſed to be plowed every year, than was formerly ſuppoſed,

Which is - - -	44 bolls
And eight acres that formerly lay in graſs, being now plowed, and yielding ſix bolls per acre, is -	48
	92 bolls

Which at L. 5 per boll, is	L. 460	0	0
The expence of ſeed and labour on the additional eight acres now plowed, at L. 12 per acre, is L. 96, but call it - -	100	0	0
There remains of profit,	L. 360	0	0

But becauſe the incloſing and hedging the ground, and purchaſing this extraordinary manure, cannot be done without ſome expence, it ought in reaſon to be deduced from the product or increaſe that is had from the ground. Let us therefore enquire what that may be. And ſeeing we reckoned already four acres of croft and eight of outfield laboured more each year, than when we ſummed up the account on p. 474. and have allowed L. 12 for ſeed and labour on each acre; we muſt now deduce what was allowed on that account, and allow it in part payment of what charge I am at in keeping more men and horſes, than were propoſed for labouring the farm before it was incloſed; for ſince I am to reckon all the charge of men and horſes that are to labour the whole ground, the expence of labouring theſe twelve acres comes under that account.

I allow one man-ſervant and two horſes, or two oxen more to be kept on account of theſe twelve acres, than were formerly neceſſary. According to our firſt calculation, two horſes require eight bolls of corn to maintain them; and for the man's meat and wages I ſhall reckon L. 80 or L. 90. There was a boy allowed for herding, when the farm was not incloſed, which will not be requiſite now that it is incloſed: But I ſhall allow him to be kept, not only in ſummer, but in winter alſo, as he may ſerve to drive the plough: Now for his meat and wages, during the winter, (for his ſummer's keeping was charged formerly) I ſhall allow L. 40. Now theſe three men, that is the two formerly ſtated, and the additional one now to be charged, and

and the boy, I reckon ſufficient for labouring the ground, thraſhing the corn, and dreſſing the garden, and doing any other work beſide. For cutting down the additional twelve acres, I ſhall ſtate L. 24. The account will then ſtand thus:

The remainder of the account ſtated on page 474.	L.	763	9 4
The produce of 4 acres croft-land at 7 bolls per acre, is 28 bolls at L. 5 per boll. - -		140	0 0
The additional produce on 22 acres outfield, more than was formerly reckoned, at two bolls per acre, is 44 bolls - -		220	0 0
The produce of 8 additional acres outfield, now brought into tillage, at 6 bolls per acre, is 48 bolls.		240	0 0
	L.	1363	9 4

Additional Expence.

Seed 12 bolls - - -	L.	60	0 0
Horſe meat 8 bolls - -		40	0 0
Additional ſervant-man's meat and wages		90	0 0
The boys meat and wages for the winter's half year - -		40	0 0
Additional ſhearers - -		24	0 0
Sum of additional expences	L.	254	0 0
Remains of clear profit. -	L.	1109	9 4

In this account I have purpoſely omitted the additional profit that may be made of the cattle, now when the ground is enriched and incloſed; as alſo what profit may ariſe from ſowing clover, rye-graſs, and rib-graſs, and the profit that may be made of the orchard, which may contain upwards of ſeventy trees, each bearing a peck of fruit, which they may do even before they are twelve years old: But as I have reckoned nothing for lime, let theſe go to defray that and ſeveral other incidental expences, which can neither be foreſeen nor brought into account.

[*To be continued in ſome future* NUMBER.]

THE SCOTS FARMER,

SEPTEMBER 1774.

ARTICLE. LXV.

Of Fallowing or Faughing.

[From DICKSON'S AGRICULTURE, Vol. II.]

THE Author being to treat of ſchemes of management, informs, that we are thereby to underſtand the particular kinds of grain ſown; the order in which theſe particular kinds are made to ſucceed each other; the particular place in the order of ſucceſſion, where dung is introduced; and if fallowing is uſed, after what crop the land is fallowed, and what kind of grain is ſown upon the fallow.

In almoſt every county of Scotland, a different ſcheme is followed, and often more than one in the ſame county. He propoſes to illuſtrate theſe different ſchemes; examine the reaſons upon which they are founded; and in the end, point out ſuch improvements of theſe different ſchemes as ſeem obvious. But as in ſome of them fallowing is uſed, and in almoſt all of them, a change of ſpecies, or a ſucceſſion of different kinds of grain; it is neceſſary, in the firſt place, to treat of theſe two things, and to repreſent the nature and deſign of them; for without this we cannot judge properly of the ſchemes in which they are uſed.

It is not many years ſince fallowing was introduced into Scotland; and there are many ſhires, where as yet it is but little practiſed. It is certainly a very great improvement. If there is any thing that can be ſuppoſed to ſuc-

ceed in all ſoils, and climates, it is this. Fallowing may be called plowing in perfection; for, by it alone, all the advantages of plowing are acquired.

Plowing, as was ſhown in the firſt part of this treatiſe, ſerves to increaſe the food of plants, enlarge their paſture, deſtroy weeds, and remove wetneſs. * Now theſe advantages cannot be acquired in all their perfections, by any plowing that can be given betwixt harveſt and ſeed-time; and therefore, fallowing becomes neceſſary in order to attain them.

By plowing, the food of plants is increaſed, a larger and more uneven ſurface is expoſed to the influence of the air: But if the ſurface is wet, as it commonly is in the winter ſeaſon, little benefit of this kind can be expected. In proportion as ſoil is wet, it loſes its abſorbent quality, and when glutted with water, it is deprived of it altogether.

By plowing, the paſture of plants is enlarged; but if land is plowed wet, it dries too faſt when the dry ſeaſon comes on, and thereby the paſture is made leſs than if it had not been plowed at all.

By plowing, weeds are deſtroyed; but unleſs the weather is warm, the ſeeds of weeds do not vegetate; and unleſs it is dry and hot, their roots are not deſtroyed.

By plowing wetneſs is removed; by it land is laid up in the moſt proper ridges for this purpoſe; but, in the winter, ridges cannot be altered, or even made flat, without danger. Thus it appears, that fallowing is of the greateſt importance, and that, by it alone, the advantages of plowing can be fully obtained.

Fallowing was ſo much practiſed in the Roman Huſbandry, that ſeldom any ſeed was ſown but upon fallow. It is a practice that now prevails in many parts of Scotland, and is found to be a very great improvement; in order to reap the greater benefit from it, it is neceſſary that the farmer

* Vol. I. p. 415.

ner attend to the ſituation of his land, enquire where the defects lye, that prevent it from carrying good crops, and manage his fallow in ſuch a manner, as to remedy theſe defects. It will not be improper to give ſome directions that may be of uſe in this reſpect.

When land is poor and full of root-weeds, it ought to be plowed in the winter, or as ſoon in the ſpring as it is in a proper condition, that ſo it may have the benefit of the drought, and of the North and Eaſt winds, which are common at that ſeaſon. It ought to be plowed in ſuch a manner, as to expoſe the largeſt and the moſt uneven ſurface; becauſe thereby the drought has the eaſier acceſs to deſtroy the roots, and the winds have the eaſier acceſs to impregnate the ſoil: The kind of plowing moſt proper is, in very narrow ridges, and very broad and deep furrows; becauſe the narrower that the ridges are, and the broader and deeper the furrows, the larger and more uneven is the ſurface made.

It ſhould be plowed a ſecond time early in the ſummer, in the ſame kind of ridges and furrows; but acroſs, if the ſituation of the land allows. This renders the ſurface ſtill more extenſive and uneven; and if in any places, by the former plowing, the earth of the furrows have been turned over whole, they are broken by the croſs plowing, roots are better expoſed, and the air has eaſier acceſs

The third plowing ſhould reverſe the firſt, turn the crowns into the furrows, and the furrows into the crowns. This is better than plowing at random, without any regard to the firſt made ridges; for thereby the ſoil buried in the firſt made crowns, is more fully expoſed by turning them into furrows.

Sometimes this kind of land riſes in large clods, and continues in that ſituation, though expoſed for a conſiderable time,

time to the influence of the air. This makes an after-plowing very difficult: And indeed, when a plowing is given to land in this ſituation, it ſerves little other purpoſe than to turn over the clods. In this caſe the heavy roller muſt be uſed immediately before plowing; which in ſome meaſure reduces the ſoil, and renders the plowing more beneficial.

If the fallow is to be dunged and ſown with wheat, and if the ſurface is very rough, it will not be amiſs to harrow and even to roll it, before the dung is laid on, and the land gets the laſt plowing or ſeed-furrow. The rolling breaks the clods, and the harrowing takes out the roots that remain; and as the land is to be plowed immediately, the harrowing is no diſadvantage, even though all the roots ſhould not have been deſtroyed, I need ſcarcely obſerve, that this operation of harrowing or rolling, ſhould be performed immediately after a ſhower, as thereby it becomes more effectual, for the purpoſes for which it is deſigned. Clods upon the ſurface, after wheat is ſown, do no harm; they rather do good; they afford a ſhelter to the young plants during the winter, and their mouldering down in the ſpring, as they always do after froſt, affords a freſh ſupply of nouriſhment: But clods upon the ſurface, before the ſeed-furrow is given, prevent the dung from being equally and regularly ſpread, and render it difficult to plow with ſuch exactneſs as the ſeed furrow requires,

When the fallow is intended for Lincolnſhire barley, or even the common barley, and the ſeed to be ſown on the winter-furrow, it may be treated in the ſame manner as when for wheat. But if it is not to be dunged, or if it is not to receive the ſeed-furrow till the ſpring, then in this caſe, though the land be rough, there is no neceſſity to harrow before the plowing in autumn: for the rougher that the ſurface is, and the more clods there are on the land

land during the winter, it is kept in better order, receives greater benefit from the air, and is ſooner in a condition for being plowed in the ſpring. The clods, however large or numerous, are diſſolved by the winter froſts, and the land is found free and open in the ſeaſon of plowing. If the land requires to be early ſown, as all ſtiff ſoils do, and it is propoſed to lay on dung, it is proper to take the advantage of the winter froſt for this operation. Even though the ſpring is dry, yet carriages cannot go with ſafety in that ſeaſon, upon this kind of land.

When land is rich and full of the ſeeds of weeds, it ſhould be managed in a very different manner. It may be plowed either in narrow or broad ridges, or even without making any ridges; but then it muſt be plowed in very narrow furrows, that ſo the mould may be broken as much as poſſible, the ſeeds expoſed to the air, and the ſap preſerved. If the weather is moiſt, and the land mellow, it is not neceſſary to harrow immediately after plowing, the allowing the land to lye for ſome time after it is plowed, expoſes a larger quantity of the ſoil, and conſequently, a greater number of ſeeds to the influence of the air; and if the ſap is not exhaled, a greater number of ſeeds likewiſe are thereby brought to vegetate. When the young plants appear, then is the time for harrowing. This operation not only deſtroys the weeds that have appeared, but it likewiſe expoſes a new ſurface, and, by giving air to the other ſeeds, immediately produces another crop. But if the weather is dry, or if the land riſes in clods, it is neceſſary to harrow immediately after the plough. This preſerves the ſap in dry weather, and it breaks the clods, and thereby gives air to the ſeeds contained in them; and without ſap and air it is certain, that ſeeds will not vegetate. At what time the firſt furrows ſhould be given to this kind of fallow, and how many plowings it ſhould receive, cannot be determined. Theſe muſt be left to the judgement of the farmer, who muſt determine from circumſtances.

I ſhall only obſerve, that though it is a benefit to all kinds of fallow, to be plowed early and often, yet it is not neceſſary to plow this kind, either ſo early or ſo often as the other kind mentioned.

It may be obſerved, that the method of increaſing the vegetable food by plowing, is different from the method of enlarging the vegetable paſture; and that the method of deſtroying root-weeds is different from the method of deſtroying ſeed-weeds: But the way of increaſing the vegetable food, is nearly the ſame with the way of deſtroying root-weeds, and that the way of increaſing the vegetable paſture, is nearly the ſame with the way of deſtroying ſeed-weeds. When the deſign of fallowing is to increaſe the food of plants, and deſtroy root-weeds, or when it is to enlarge the paſture of plants, and deſtroy ſeed-weeds, the way of managing the fallow is plain and obvious. But ſometimes the land is in ſuch a ſituation, that in fallowing we muſt have in our view things that require different management. Thus, it may have little vegetable food, and at the ſame time have a ſmall paſture, or be full of ſeeds; or it may be full of roots, and at the ſame time be full of ſeeds or have a ſmall paſture. When this happens, it is neceſſary to manage the fallow at firſt, as directed for land that is poor and full of root-weeds. It ſhould be plowed, as ſoon as the drought in the ſpring comes on, in broad furrows and narrow ridges. In the beginning of ſummer it ſhould be plowed acroſs after the ſame manner: And after allowing it to lye for ſome time in that ſituation for the ſun to deſtroy the roots, and the air to impregnate the ſoil, it ſhould be reduced by the harrow and roller, which, with the aſſiſtance of a ſhower, will make all the ſeeds near the ſurface ſpring. After allowing time for this, it muſt be plowed again, in as narrow furrows as poſſible, and harrowed either immediately or ſome time after, as has already been directed, according as the ſituation of the land requires

quires. By the firſt two plowings, the ſoil is expoſed to the influence of the air, and the root-weeds are deſtroyed; and, by the harrowing and rolling after the ſecond plowing, and by the third and the harrowings attending it, the paſture is enlarged, and the ſeed-weeds deſtroyed.

When the fallow is intended for wheat, it gets the ſeed-furrow in courſe in the ordinary ſeaſon: But if it is for barley or oats, it muſt be laid up in proper ridges before the wet ſeaſon comes on; for it would be very hurtful to allow it to lye all winter with the ſurface ſmooth, and the furrows filled up, which is the ſituation of the land after harrowing. Oats or winter barley may be ſown upon this furrow, if the land is ſtiff, but another furrow is neceſſary for ſpring-barley, or even for oats or winter-barley, if the land is ſoft and mellow.

As I have already hinted, it is impoſſible to determine exactly the number of plowings neceſſary for fallow. This muſt be left to the judgment and diſcretion of the farmer, according to the ſituation of the land, and other circumſtances. I have endeavoured to aſſign a reaſon for each of thoſe that have been recommended. In one caſe, when we ſuppoſed the chief deſign of fallowing to be the deſtroying of ſeed-weeds, neither the ſeaſons of plowing, nor number of plowings, were mentioned. This muſt be regulated by the coming up of the weeds. When all the weeds, after plowing and harrowing are come up, that it is reaſonable to expect from the ſituation of the land, then it ſhould be plowed again. To plow before the weeds come up, ſerves no purpoſe as to the deſtroying them. If the land is ſoft and mellow, fewer plowings are neceſſary, for every plowing may be attended with more harrowings than one, and on land in this ſituation, harrowing has almoſt the ſame effect with plowing; for it deſtroys one crop of weeds, and makes another ſpring.

Perhaps

Perhaps ſome farmers, notwithſtanding I have left much to their own judgment, may however think, that the particular directions I have given are to no purpoſe: I would aſk ſuch perſons the following queſtions: Whether fallowing is an improvement? Whether the fallow receives any benefit from plowing? And whether there is any difference betwixt good and bad plowing? Theſe perſons muſt anſwer theſe queſtions in the affirmative, if they deſerve the name of farmers; and, in conſequence of this, muſt not they allow, that one way of plowing the fallow, may be more beneficial than another? I muſt acknowledge indeed, that the operations of the farmer in the management of his fallow, muſt be regulated by circumſtances, and particularly by the ſeaſon; and when I give directions, I mean no more than that the farmer ſhould always have ſome end in view in his operations, and that he ſhould promote that end as much as circumſtances allow.

In the directions which I have given for the management of fallow, I have ſuppoſed that the land is in the ſituation moſt proper with reſpect to the height of the ridges. It is certain, that in many parts of Scotland, the ridges are both higher raiſed, and broader, than the nature of the ſoil requires. In the firſt part of this treatiſe, I have given ſome directions about the altering ridges *. To theſe, when ridges are too high raiſed, and too broad, it will be proper to attend. If this is done, it will not be found very difficult to reduce ridges in fallowing, as much as is neceſſary, and at the ſame time make the fallowing anſwer the other ends propoſed.

Of a change of Species.

In the ſchemes of Agriculture practiſed in Scotland, a change of ſpecies is generally uſed. The advantages ariſing from it are chiefly theſe two; a more beneficial crop is produced, than if the ſame grain was repeated; and the land

* Vol. I. p. 421.

land by the change may be prepared for a more valuable crop afterwards.

Some plants require more food than others; ſome require more culture than others; ſome feed near the ſurface, while others draw a conſiderable part of their food from a conſiderable depth; it may be added, that ſome plants exhauſt land very much of its vegetable food, while others take away but little, and that ſome encourage the growth of weeds, while the culture given to others deſtroys them. Theſe things make it neceſſary to give attention to the manner in which the different crops are made to ſucceed each other.

Gain is what the farmer ſhould always have in his view, in the way of managing his land. To raiſe the moſt valuable grain that his land can carry; and to have good crops with the leaſt labour and expence, is the certain way to gain: But how to attain theſe is the difficulty. The having ſuch a ſucceſſion of crops, as require the leaſt culture in proportion to their value and goodneſs, as beſt diſcourages the growth of weeds, and as is moſt proper to keep the land in good heart, ſeems to be a proper way to attain them.

Wheat is the moſt valuable grain; But a good crop of wheat is not to be expected, if it is repeated on the ſame land. It requires a great deal of nouriſhment, it greatly exhauſts the land, upon which it grows, of its vegetable food, continuing near eleven months in the ground, it allows little time for culture, and root-weeds lying long undiſturbed are thereby greatly encouraged,

Barley is the grain next in value; A better crop of it may be expected than of wheat, if repeated on the ſame field. It is not more than three months in the ground; it does not exhauſt land ſo much of its vegetable food; it allows time for culture; and the growth of weeds is not much encouraged: hence we find that, in ſome parts of Scotland, it was a cuſtom formerly to ſow nothing but bear

upon ſome fields: But then barley is a tender plant, is a bad forager and a quick grower; the ſoil muſt be well reduced to enable it the more eaſily to find its food; for if it is not well nouriſhed while young it becomes ſickly, and never produces a good crop though the land may contain plenty of vegetable food; and therefore though a good crop of barley does not exhauſt land ſo much of its vegetable food as a good crop of wheat, yet a ſucceſſion of crops of barley, if the ſame culture continues to be given to the barley-land, may perhaps exhauſt land as much as a ſucceſſion of crops of wheat, while the culture is much more expenſive. But then it may be obſerved, that barley is a very proper grain to ſucceed wheat. As the vegetable paſture is leſſened, and root-weeds are encouraged by the wheat-crop remaining long in the ground; ſo by the culture given to the barley-land, this vegetable paſture is again increaſed, and theſe root-weeeds deſtroyed.

Oats is the grain next in value to barley. Of late years they have become nearly of equal value*. Was it not that the barley is a more uncertain crop than the oats, this difference would ſtill be leſs.

The oat is a hardy plant and a good forager, and therefore properly adapted to the cold northern climates and ſoils. Better crops of it may be expected, when repeated, than of wheat or barley. It does not exhauſt land ſo much as wheat, nor does it ſo much encourage the growth of root-weeds, except it is ſown in the ſame ſeaſon. A very ordinary crop of wheat has more real ſubſtance than a good crop

* The reaſon of this is obvious: The increaſe of the number of horſes both for luxury and improvement has increaſed the demand for oats, and the increaſe of the duties upon malt, ale, and ſpirits, has leſſened the demand for barley.

crop of oats: Beſides, the oat-land receives more benefit from the air in the winter ſeaſon, and leſs damage from the rain, than the wheat-land does. Perhaps it may be juſtly aſſerted likewiſe, that the oat does not exhauſt land ſo much as barley. Land ſometimes produces as great a bulk of oats as of any grain whatever; yet what is commonly reckoned a good crop of oats is inferior both in bulk and quality to what is reckoned a good crop of barley. Beſides, the culture given to the barley-land enables the roots of the barley to ſearch every part of the ſoil. For theſe reaſons it may be expected, that a ſucceſſion of crops of oats upon the ſame field, may turn out to greater advantage, than a ſucceſſion of either wheat or barley. Agreeable to this we may obſerve, that it is a practice to repeat crops of oats ſucceſſively for ſeveral years upon ſome lands. But theſe are lands that are not able to carry a crop of either barley or wheat by the culture given the oats, and the ſcantineſs of the crop deters the farmer from riſking a more expenſive culture. It is probable indeed, that if proper culture is given this land, it may carry one crop of barley in place of one of the crops of oats: but then the expence of the culture neceſſary to reduce it to a proper tilth for barley, will do more than over-ballance all the difference of the value of the crops. On rich lands oats very properly ſucceed barley, eſpecially if barley has ſucceeded wheat. The damage done to the land by a crop of wheat in its leſſening the vegetable paſture, and encouraging the growth of weeds, is in ſome meaſure repaired by the frequent plowings given to the barley, and therefore a grain that requires little culture very naturally ſucceeds.

Peaſe or beans is the other grain which we make uſe of in Scotland in a regular ſucceſſion. Though a crop of peaſe is ſaid to meliorate the ſoil, yet even this grain does not ſucceed when repeated. Peaſe extract much of their food from below the ſtaple of the ſoil, where the paſture

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is ſmall, and to which the groſſer air does not penetrate. After the firſt crop, therefore, they cannot receive much benefit from this extraordinary paſture: On this account, a good crop is not to be expected if frequently repeated. Beſides, the pea is a plant whoſe roots are eaſily looſed from the ground. It is this that prevents them from ſucceeding on land that contracts and expands much by ſudden changes from wet to dry. Of this nature are all ſoils in which there is any great proportion of undiſſolved moſs. When land is much pulverized, the ſame effect is produced in a certain degree; and a good crop of peaſe ſeldom fails to bring it to this ſituation. But this it is needleſs to inſiſt upon, as peaſe is a grain that no farmer ever thinks to repeat upon the ſame field.

A crop of peaſe does not extract much vegetable food from the land. The real ſubſtance of what is commonly reckoned a good crop of peaſe, is very little when compared with a good crop of wheat, or barley, or oats. Six bolls of peaſe upon an acre is reckoned as good a crop as eight or nine bolls of barley or oats, or even ten bolls of wheat; and in a boll of peaſe there is not that real ſubſtance that there is in a boll of any of the other grains. Peaſe draw a part of their nouriſhment from below the reach of the plough, and below the reach of the roots of the other grains. By covering the ſurface, they deſtroy the weeds and raiſe a fermentation, by which the paſture is enlarged. Theſe effects of a crop of peaſe point out their place in a ſucceſſion of different grains. They naturally come in after a crop of wheat or oats. The damage done to the land by the long continuance of the crop of wheat, or the little culture given to the crop of oats, is in ſome meaſure repaired by the crop of peaſe; the paſture that was leſſened is enlarged, and the weeds that were encouraged are deſtroyed. A crop of peaſe is not ſo properly introduced after a crop of barley.

barley. Barley leaves the land too well pulverized for a crop of peaſe; and although the peaſe ſhould ſucceed, yet the beneficial effects of the peaſe-crop are not ſo diſcernable.

The effects of a crop of peaſe, as they point out what crops they ſhould ſucceed, ſo they likewiſe point out what crops ſhould ſucceed them: As they in ſome degree meliorate the ſoil, wheat or barley, which require much culture, very naturally ſucceed: Oats are improper, as they are good foragers, and need leſs culture.

Of the different Schemes of Management in Scotland.

There is a great variety of ſchemes of management. In ſome of theſe ſchemes fallowing is practiſed; and in ſome the land is never allowed to reſt. In ſome of them, almoſt all the kinds of grain uſed in Scotland, are made to ſucceed each other; and in ſome of them, very few kinds of grain are ſown. In ſome, the ſowing graſs ſeeds for hay is a part, and ſometimes there is an attempt to raiſe a crop of turnip or potatoes on the fallow.

The arable lands in Scotland, are divided into infield and outfield. Formerly the infield was kept conſtantly in tillage, and a crop ſown every ſeaſon: Upon this land was laid all the dung produced by the farm. The outfield was in tillage and paſture alternately, commonly three crops of corn taken, and allowed to lye from three to ſix years in graſs. Seldom any dung was laid upon this land; ſometimes indeed, the cattle were folded upon it, and then four or five crops taken inſtead of three. On this land, oats were the only kind of grain that was ſown.

The outfield land continues ſtill to be managed in the ſame manner as formerly; but, in many places, a much better way of managing the infield land is introduced. It is ſometimes fallowed, and ſometimes ſown with graſs-ſeeds.

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By this kind of improvement, and the aſſiſtance of lime, marles, and other foreign manures, the outfield land is turned into infield. The different ſchemes of management upon the infield land, are what I propoſe chiefly to examine.

The ſcheme of management upon the outfield land ſeems very proper, and is not capable of improvement, except the ſoil itſelf is improved. The land is poor: The taking more than three crops would not anſwer the expence of management; and the taking theſe three is more advantageous than the allowing the land to lye always in graſs, and the allowing it to lye ſome years in graſs is neceſſary, that it may recover after being exhauſted by the crops, and that the quickening graſs, encouraged by the tillage, may be deſtroyed*.

Of the Scheme in which Wheat is ſucceeded by Barley, Oats, and Peaſe, in their order, without a Fallow.

Was this treatiſe by accident to fall into the hands of a farmer upon the continent, or even of a farmer in one of the counties of England, where agriculture is ſuppoſed to be brought to the greateſt perfection, it would not be an eaſy matter to make any of them believe, that land in Scotland continued to be croped in this manner, and that the crops continued to be worth the expence of ſeed and labour. Yet it is a truth well known, that this was the ſcheme of management in ſeveral places upon the infield land; and even, without the benefit of city-dung, the crops were not deſpicable.

It is not my deſign to recommend this practice: All that I propoſe is, to ſhow the reaſons for the ſucceſſion of crops in the order mentioned.

Wheat, as has beed already obſerved, continues long on the

* Vol. I.

the ground: By this the vegetable paſture is leſſened, the growth and increaſe of weeds are encouraged. Wheat requires much nouriſhment; hence, by a crop of this grain, the land is much impoveriſhed. Now, the culture given to the crop of barley that fallows, in ſome meaſure repairs theſe damages done by the crop of wheat. The wheat is early reaped; and the firſt plowing for the barley, given before the dry ſeaſon is over, deſtroys the roots of the weeds, and covers the ſtubble. The land being plowed dry, riſes in clods, by which a large ſurface is expoſed to the influence of the air, and a ſupply of vegetable food acquired; and, what is likeways of great importance, the land is expoſed to the winter froſt, and the paſture enlarged. Hence it was the univerſal practice of the perſons that proſecuted this ſcheme, to begin their plowing by fallowing the bear-land, (which is the name that this plowing gets,) even in the time of harveſt, and ſometimes before the wheat-crop was carried from off the ground. By the ſecond plowing in the ſpring, called ſtearing the bear-land, when done with judgment, the paſture is further enlarged; and, by expoſing a new ſurface, a further ſupply of vegetable food is acquired: And, when this plowing is fallowed by a harrowing, the ſeeds of weeds are encouraged to vegetate.

The ſeed-furrow deſtroys theſe weeds, and further enlarges the vegetable paſture. Thus it appears, that a crop of barley, when the land is cultivated in this manner, is very proper to ſucceed a crop of wheat.

A crop of oats as naturally ſucceeds a crop of barley, as a crop of barley ſucceeds a crop of wheat. The culture given to the barley-crop, makes the ſoil ſoft and mellow, and in ſome meaſure deſtroys weeds. This grain therefore may be followed by another that requires leſs culture than the barley, and gives greater encouragement to weeds; ſuch

ſuch are the oats. They require leſs culture than the barley: The land deſigned for them, ſeldom receives more than one plowing, and yet good crops are often reaped. Oats therefore after barley, offer the farmer a valuable crop at a ſmall expence.

A crop of peaſe, as naturally follows a crop of oats, as a crop of oats follows a crop of barley. By the little culture given to the oats, and the length of time that the crop is on the ground, the land is exhauſted; by the land continuing long untouched, the growth of weeds is encouraged, and the paſture leſſened. A crop therefore ſhould follow the oats that repairs theſe damages. This is done by a crop of peaſe. Peaſe require little nouriſhment; they mellow the ſoil hardened by reaſon of the little culture given to the oats, and their continuing ſo long on the ground: and they deſtroy the weeds, which were encouraged by that crop. And the peaſe having thus mellowed, cleaned, and prepared the ſoil, are very naturally followed by wheat.

In this ſcheme of management, there is no fixed crop to which the dung is applied. Sometimes to the peaſe, ſometimes to the wheat, and ſometimes to the barley. It is not poſſible for the farmer, except in ſome very particular ſituations, to procure as much dung as is ſufficient for one of the four grains which he ſows, and therefore he can have no regular or ſtated way of applying the dung. The only rule which he has, and which indeed is not a bad one, is to dung the land that ſeems to need it moſt, without any regard to particular crops. However in a farm managed in this manner, there muſt always be ſuch a quantity of the land in bad order, as to make it difficult for the farmer to determine where he ſhall apply the dung, unleſs he has laid down ſome ſcheme, upon which he is to proceed: And it is probable, that, by a proper management of the dung, the ſame quantity may have a better effect, and the land be kept in better order.

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As wheat is the moſt valuable grain, it may poſſibly be alledged, that it deſerves the greateſt attention and beſt culture; and therefore, that the dung ought to be applied to it. When land is much wore out, it is certain that a good crop of wheat is not to be expected without dung; and therefore, when the farmer, notwithſtanding the ſituation of the land, ſtill perſiſts in his ſcheme of ſowing wheat, then indeed dung ſeems to be abſolutely neceſſary. But there are ſome diſadvantages and inconveniences that attend the applying the dung to the wheat-crop, which I muſt take notice of. It crowds too much work immediately after harveſt, and either occaſions the plowing of the barley-land to be delayed, or renders the ſowing of the wheat itſelf too late. It does more, it delays, in conſequence of theſe, the plowing of the oat-land, and turns the cattle and ſervants idle, if there ſhould be froſt in the winter to prevent the plows from going. But this is not all: If, in conſequence of a bad crop of peaſe, the quickening-graſs has increaſed greatly, as is frequently the caſe, then the dung applyed to the wheat-crop, unleſs it makes it ſo ſtrong and rich as to lodge, encourages this graſs; and this, tho' the wheat-crop may be tolerable, muſt endanger the crop of barley that follows. I would therefore adviſe the farmer who follows this ſcheme of ſowing wheat always after peaſe, that, when the peaſe crop fails, and diſcovers to him the abſolute neceſſity of applying dung to the wheat, that he plow down the peaſe; or, if he cannot conveniently ſpare the ſtraw, that he mow them immediately before harveſt. By this means, it will be in his power to give his wheat-land two plowings if he pleaſes, and to dung it without being obliged to delay any of the neceſſary work after the harveſt, and thereby he will remove almoſt all the inconveniences that attend the applying dung to the wheat.

When the land is naturally very rich, as all land ought to

be, that the farmer pretends to manage in this manner, and conſequently very much infeſted with weeds, the applying the dung to the peaſe crop is very proper. By this a good crop of peaſe is ſecured, and by a good crop of peaſe the weeds are deſtroyed, and the land is mellowed, and properly prepared for wheat, ſo that a tolerable crop of it may be expected likewiſe. But when the land is proper in its nature for peaſe, and ſeldom fails to produce a good crop, this, in ſome meaſure, ſecures the crop of wheat; and therefore in this caſe, it is beſt to apply the dung to one of the other crops.

Barley is a crop to which the dung may be applyed very properly when the land is of ſuch a nature as to allow it to be laid on with ſafety: But if it is ſtiff or wet, unleſs when there is froſt in winter, or the ſpring remarkably dry, carts cannot go upon it without great danger. Theſe circumſtances ſhould be attended to by the farmer, and, from them, he will be able to judge to which of theſe crops he can apply the dung with the greateſt ſucceſs.

Though I have inſiſted upon this ſcheme of management, yet it muſt appear to every intelligent farmer to be a bad one. It is impoſſible by it, without having dung at command, to keep the land in good heart for many years, and though the land ſhould continue rich, yet ſuch encouragement is given to weeds, that they muſt annually rob the crop of corn, of a great part of its nouriſhment. Beſides, in this ſcheme, there is not a proper ſucceſſion of labour. There is indeed a proper enough ſucceſſion from the harveſt to the end of the ſeed-time. Immediately after the wheat crop is cut down, the barley land is fallowed; to this ſucceeds the plowing of the land for wheat. After the wheat-ſeed is finiſhed, ſuch of the oat-land may be plowed as needs moſt to be mellowed by the winter-froſt. If the plowing is ſtopped by the ſeverity of the froſt, the dung may be laid on, whether it is intended for barley or peaſe. When the froſt is gone, the remaining part

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of the oat-land is plowed, or the land for peaſe, according as circumſtances require. When the peaſe and oat-ſeed are finiſhed, the barley-land gets the ſecond or ſtearing furrow, as it is called, and to this the ſeed-furrow ſucceeds, which laſt operation may be continued till near the end of May. If the dung intended for the barley, has not been laid on during the winter, the ſituation of the land muſt determine at what time afterwards, whether before or after the ſteering furrow; it is the ſame thing which of them is done as to the ſucceſſion of the labour. Thus far there is a proper ſucceſſion; but from the finiſhing of the barley-ſeed to the beginning of leading in the corn, there is little employment: and indeed in the laſt age through the whole ſummer, the farmer had no employment for his ſervants and cattle, but cutting thiſtles and driving a few neceſſary carriages.

Of the Scheme in which Wheat is ſucceeded by Barley, Oats, and Peaſe, in their order, with a Fallow.

If land is very rich, and produces a great deal of dung, or if it lies in the neighbourhood of a city from whence dung may be carried, and at the ſame time is ſo dry ſituated as to receive the full benefit of plowing, it may be managed in the manner mentioned in the preceeding chapter, and produce tolerable crops. But, however, from what has been ſaid in the chapter of fallowing, it muſt appear that this operation muſt be an improvement to every ſoil; and indeed, from experience, it is found to be ſo. Beſides its being an improvement, fallowing tends to the œconomy of the farm, a part of the land is plowed, and a part of the dung carried out in the ſummer ſeaſon, and conſequently leſs to do in the winter; and what ought not to be forgotten, when there is fallow, foreign manures, ſuch as lime or marles, can be more conveniently applied.

The point which falls naturally to be conſidered here,

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is the particular advantage of fallowing according to its place in the ſucceſſion of the crops, in the order already mentioned. The place into which the fallowing is commonly introduced, is betwixt the wheat and the barley. The land exhauſted by the wheat-crop is recovered, and the weeds encouraged by that crop are deſtroyed by the fallow; and thus it is brought to a proper ſituation for the barley-crop; eſpecially if dung is laid upon the fallow, as is commonly done.

The only objection that occurs to me againſt this practice is, that leaſt attention is given to the wheat-crop, which is always conſidered as the moſt valuable. When the the wheat-crop is immediately before the fallow, the ſoil is in a worſe ſituation for it than for any of the others. But, in anſwer to this, it need only be obſerved, that it is very difficult to make any ſatisfying calculation of things of this kind, If a farm is ſituated in a country where there is little demand for any grain except wheat, then a particular attention is to be given to the culture of it above any other grain. But this is not the caſe in any part of Scotland; there is commonly as great a demand for the other grains as for wheat, at leaſt for barley and oats; and therefore theſe have as certain and fixed a value as wheat has; and, in every ſcheme of management, as much attention ought to be given to the crops.

If we conſider the fallow with reſpect to the whole crops, we will obſerve that the wheat does moſt hurt, by being placed next to the fallow. We may very juſtly ſuppoſe, that weeds are always upon the increaſe from one fallow to another. Now, if the wheat is immediately after the fallow, the weeds make quicker progreſs at firſt, than if the barley is in that place; and therefore the wheat muſt do more harm to the other crops by being before them, than they do to the wheat by being before it.

Although fallowing is now become a general practice in many places, yet there are but few perſons that regularly

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fallow every fifth year. Thoſe who do ſo, and ſollow the order of ſucceſſion already mentioned, always place the fallow betwixt the wheat and barley. It cannot properly be introduced in any other place: Not betwixt the barley and oats; for the barley receives an extraordinary culture, and the oats require but little: Not betwixt the oats and peaſe, for the peaſe require no more culture than the oats, and in ſome degree of themſelves meliorate the ſoil; and not betwixt the peaſe and wheat, for if the peaſe-crop is good, the land is thereby tolerably well prepared for wheat.

In many places where fallowing is practiſed, land is fallowed only once in ſeven, eight, or nine years. In this caſe, the fallow may be properly introduced in a different manner, and yet the ſame ſucceſſion obſerved, at leaſt, for the firſt four crops. When more crops than four are to be taken, wheat may be ſown after the fallow and the other crops in their order; but it is improper to ſtop immediately after one rotation, becauſe the laſt of the ſucceſſion is peaſe. The kind of crops that ſhould follow, depends upon the ſituation of the land, and the number intended by the farmer. before he fallows again. If he propoſes to take four, then the wheat muſt be omitted; after the firſt crop of peaſe, barley muſt follow, and the others in their order ending with wheat. If he intends to take three crops, and the land is in good order, he may take the three next in rotation, wheat, barley, and oats. If the land is not in good order, and yet the ſituation of the farm makes it neceſſary that three crops be taken before the fallow, then it will be proper to change the order of the ſucceſſion, and take barley, peaſe and wheat. Theſe three are not ſo ſevere as the others, for there is a crop of peaſe in this caſe in place of a crop of oats in the other. If he propoſes only to take two crops after the firſt rotation, thoſe that fall naturally are barley and oats; and if only one, then it may be either wheat or barley. Thus, if the farmer takes eight crops after the fallow, he has two

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of each grain, beginning and ending with wheat; If he takes ſeven, he has either one of peaſe or of oats, and two of the others, as he thinks his land in good or bad order: If he takes ſix, then he has one of wheat and one of peaſe, and two of barley, and two of oats: And if he takes only five, he has two of wheat, or two of barley, and one of the others.

In all the above caſes, we have ſuppoſed that the farmer introduces his fallow immediately before the wheat, and that this obliges him, in obſerving the order of ſucceſſion mentioned, to take more than four crops, before he fallows again. Sometimes the farmer, when he introduces his fallow immediately before the barley, though he can very properly introduce it again after four crops, yet thinks it proper to take more than four. If he chooſes to take eight, he takes two rotations in the order mentioned, and thus has two crops of each grain beginning with barley, and ending with wheat. If he chooſes ſeven, he omits the oats in the ſecond rotation, or he omits the wheat, and changes the order; after the firſt crop of wheat, takes peaſe, barley, and oats. If he chooſes ſix, goes on in the order, and ſtops after the ſecond crop of oats, and has only one crop of wheat and one of peaſe; or after the firſt rotation, alters the order, and takes peaſe and wheat, or peaſe and barley. In this order of ſucceſſion, the farmer ſeldom takes five crops, either contents himſelf with four, or takes more than five.

It will naturally be remarked, that, in none of the above ſchemes, we ſuppoſe the fallow to be introduced immediately after peaſe or barley. When land is in bad order, whatever crop it has carried laſt, it ſhould certainly be fallowed, and this is agreeable to the practice of ſome farmers; but when they do this, it is commonly when theſe crops have not ſucceeded ſo well as they expected; and therefore this is not to be received into a general

ſcheme.

ſcheme. In theſe ſchemes mentioned, every crop is expected to be good for the nature and ſituation of the ſoil, and when they are ſo, after a crop of peaſe or barley, another good crop may be expected; for peaſe are ſuppoſed to meliorate the ſoil, and the culture given to the barley is of uſe, not only to that crop, but alſo to the one that follows; and therefore to fallow after any of theſe crops is either, in ſome meaſure, to loſe the melioration given to land by the peaſe-crop, or part of the advantage ariſing from the culture given to the barley.

Perhaps it may be expected, that we ſhould be more particular in inquiring into which of the two places mentioned the fallow ſhould be introduced, whether immediately before the wheat or before the barley.

It has already been obſerved, that wheat is the principal and moſt valuable grain, and requires the higheſt culture. This is a reaſon for ſowing this grain immediately after the fallow. It has been obſerved likewiſe, that wheat exhauſts the land moſt, and gives the greateſt encouragement to the growth of weeds. This is a reaſon for ſowing the barley immediately after the fallow. Whether the one or the other of theſe reaſons ſhould prevail, depends upon circumſtances. If there is a more certain market for wheat than for the other grains, and the land from its ſituation not very apt to run into quickening graſs, and other weeds of the ſame kind, then wheat may be ſown; but if the market for the other grains is as certain as for wheat, and the land infeſted with weeds, then the barley ſhould be preferred. But ſuppoſing that the value of an equal number of crops in both ways are equal; in this caſe, barley after the fallow ſhould be preferred likewiſe; becauſe, by this method, leſs labour is required. The barley after the fallow, requires no more plowings than the wheat after the fallow; but the barley when after wheat requires three plowings, whereas wheat after peaſe receives but one.

ARTICLE.

ARTICLE LXVI.

FARMERS KALENDAR.

OCTOBER.

Hiring Farms.

THIS is the month for hiring and ſtocking farms, and moving from one to another. Upon ſuch occaſions, the farmer ſhould have all his ſenſes about him: he ſhould be equally clear-ſighted to all the advantages of a farm, and all the diſadvantages, that he may be able to draw a balance between them, and compare that balance with the rent demanded. Let him remember, that he muſt equally diſcard a too ſolicitous prudence, which doubts every benefit, and a too daring courage, which over-looks or leſſens real evils. It muſt be open to almoſt every perſon's obſervation, that the common farmers loſe themſelves very much in deliberating concerning a farm: they have ſo many miſtaken rules of judging, that we very often ſee them reject farms that, ſoon after, prove the fortunes of ſuch as hire them: they are very apt to take one falſe guide in particular, the ſucceſs of the laſt tenant. If a man makes a good deal of money on a farm, or leaves it for a much larger, numbers will immediately apply with great eagerneſs to get it, almoſt without viewing; but, if a tenant or two breaks, or is poor on a farm, moſt of the neighbours conſider little further; they attribute all to the land, and avoid it, under a ſtrong idea, that, without a fall of rent, no money can be made on it. All theſe notions are abſolute abſurdities; for the management of various farmers is ſo eſſentially different, that ſucceſs depends very little on rent. A farmer, with a proper ſum

of money in his pocket, hires a farm, and thrives on it; another, with an hundred pounds leſs, hires it, and ſtarves. Two farmers of the ſame ſubſtance: one manages his land with ſpirit, makes all the manure he can, ſells no ſtraw, does not croſs-crop his fields, drains them, and keeps his fences in good order; he grows rich. The other, a ſloven in theſe particulars, falls into poverty on the ſame land. Theſe are the circumſtances, that make one man rich, and another poor; very ſeldom rent: and ſurely it muſt be apparent, that ſucceeding occupiers judging of the reſpective farms by the different ſucceſs of theſe farmers, is the taking as blind a guide as they can poſſibly fix on.

Let the farmer, that is debating whether he ſhould hire a farm that is offered him, examine the ſoil well, to be able to determine its nature, the ſtiffneſs, moiſture, expoſure, levelneſs, ſlope, ſtoneyneſs; what draining, manuring, fencing, &c. &c. will be wanting; let him ſee to the roads, diſtance of market, prices of commodities, labour, &c. let him fully acquaint himſelf with the ſtate of tythes or gathering; if the latter, let him at once reject the farm. He ſhould know the poor rates, attend to the compactneſs of the fields, and conſider well the covenants relative to the croping them; for many ſuch are extremely detrimental to a good conduct of the land.

One general rule in hiring a farm ſhould never be forgotten: fix on good land, and you can ſcarcely pay too much for it; but, for poor ſoils, the leaſt rent is too high to be conſiſtent with profit. By *poor ſoils*, however, are not to be underſtood ſuch as have a command of laſting manures, that work great improvements, nor waſte lands that, under that falſe denomination, are often found the richeſt of all.

The mellow, rich, putrid, crumbling clays, or rather clayey loams, are of all ſoils the moſt profitable: ſuch as

will admit tillage ſoon after rain, and do not bake on hot gleams of ſun coming after heavy rains, when fine harrowed; ſuch land is better worth twenty-five ſhillings an acre, than many ſoils deſerve a ſhilling.

Another matter of great import, in the hiring a farm, is the taking no larger a one, than the ſum of money a man can command will ſtock properly. A common fault among farmers is the hiring too much land for their money: they are extremely eager to farm as much as poſſible: the certain conſequence of which is the conducting the ſoil in a ſlovenly, imperfect manner. A farmer ſhould never deſiſt from any work, which he knows to be right, from a want of money; and he can only prevent ſuch a ſituation, by hiring no more land than he can manage in a maſterly manner: For let any of them conſider the difference between good and bad huſbandry in all its branches, between the loſs of one, and the certain gain of the other. Making a proper uſe of natural manures, ſuch as marles, clay, chalk, &c. is never done but by farmers that have plenty of money in their pockets. In the neighbourhood of great cities and towns, variety of manures are to be had, in ſome places cheap; but, if the farmers have not money, how are they to make uſe of ſuch advantages? For theſe, and many other reaſons, a farmer ſhould never think of venturing on a tract of land, which he cannot abſolutely command; that is, farm as ſeems beſt to him.

Servants.

This is the time that farming ſervants are chiefly hired, and the attentive cultivator ſhould conſider well, before he determines on the number or the quality of his ſervants; for it is no unimportant or trifling part of his buſineſs to conduct this matter in a proper manner, and with a due eye to the nature of his farm. A conſiderable

buſineſs

buſineſs requires the employment of a bailiff;* and, as ſuch a ſervant may have material effects on the conduct of a buſineſs, it is always right in a farmer to conſider the nature of his own caſe well.

If his farm is extremely large, if his culture is very complex, occaſioning as much buſineſs on one acre as five; or, if he is abſent a conſiderable part of the year; in theſe circumſtances, the employment of a bailiff is abſolutely neceſſary; but there are ſo many ſorts of bailiffs, that a man may qualify the meaſure almoſt into that of hiring a common ſervant. A working bailiff is but a ſtep above a common head-man, anſwers extremely well for a ſmall buſineſs; but, in a large or complex one, will not anſwer. In ſuch a farm, his buſineſs is to be perpetually on the watch on all the people, of whatever ſort, employed: conſequently, he muſt not work, which confines him to one place, but employ himſelf totally in moving from one ſet of workmen to another: Inſtead of labouring himſelf, his buſineſs is to ſee that others labour as they ought.

This part of his employment renders it neceſſary, that he ſhould be of a rank ſomething above the beſt ſort of ſervants and workmen; for, if one from that claſs has the command given him, he will not be obeyed as he ought: a bailiff ſhould ever preſerve a due authority over all the people employed; and, for this purpoſe, his maſter would find it very uſeful to allow him to hire his own ſervants and labourers; or, at leaſt, to give him liberty to turn any of them away when-ever he pleaſed. The great uſe of ſuch a train of conduct is, the farmer's having only one perſon to deal with. Suppoſe he chuſes to have any extraordinary work done, either in quantity or manner, a baliff muſt be ſuppoſed to be far more willing to ſecond his views, who does nothing himſelf, than common ſervants and labourers,

* In Scotland we call him a Grieve.

bourers, whoſe labour effects the whole. In that caſe, and all others, a farmer ſhould give his orders to the bailiff, not the men. Let him order ſuch and ſuch fields to be plowed four inches deeper than common, or all his ploughs, for a time, to plow each half an acre a day more than common: never let him give ſuch orders to the plowmen, but to the bailiff. Such an upper ſervant will not be able to ſee the execution of ſuch orders, unleſs he has authority to turn away all offenders on the ſpot, and hire others that are more complying. And there is great reaſon to think, that a bailiff of that nature will be able to get more work done than any maſter in his own perſon, unleſs he is one that works with his men.

As to other ſervants, the principal is the plowmen; for on them depends, in a good meaſure, the ſucceſs of all the crops. In a large buſineſs, it will be very difficult to have all good hands: but a man ſhould aim at it as much as poſſible: for a bad plowman, commonly ſo called in the country, makes very indifferent work, but ſkims over the land in an irregular manner, and rie balks half he goes over. But let me remark, that the men, who have in general the reputation of being good plowmen, commonly found it on ſtraight or level plowing; both which are excellent ingredients, and abſolutely neceſſary; but depth ſhould alſo be conſidered. In ſome ſoils, if a man comes after a bad plowing farmer, he may new-manure all his land by plowing a few inches deeper than common; but moſt plowmen have an averſion to plowing deep; nor can you ever depend on its being done, if you do not, or your bailiff, watch them perputually, and inſiſt, in the moſt peremptory manner, on what you require being executed. This is one of the points, in which, if you keep a bailiff, you muſt give him your particular orders, and look to him for the general obedience of all the men, allowing him to turn away thoſe that diſobey his commands:

and

and do not forget, that this is an object (deep plowing) that cannot be too much attended to on many ſoils.

If no bailiff is kept, you muſt be much more attentive in the hiring your plowmen; to chuſe ſuch as will probably be induced to obey your orders, without that round of murmuring and complaints ſo often heard from theſe people: if you do not get docile people, you will find great difficulty in having your land managed in the manner you like beſt. Shepherds, hog-herds, cow-herds, driving-boys, and all other ſervants, are now hired; and, as characters are ſcarcely ever given among farmers, it much depends on your quick judging of the accounts the fellows give of themſelves; and, perhaps, their phyſiognomy may be of ſome uſe.

Farm Yard.

This being the laſt month that cattle will either be in the fields, or fed on green meat at home, the farm-yard ſhould now be in perfect order to receive them. For directions as to the Farm-yard, ſee our Vol. I. p, 125.

The Teams.

About the latter end of this month, the horſes muſt be put to dry meat; that is, hay, oats, and chaff. Here begins the great expence of horſes; for they muſt be fed at a conſiderable coſt, or they will fall off in fleſh, ſo as to be able to do but little work. The beſt of hay ſhould be given them, and as much of it as they can eat; alſo as much chaff as they can like: that ariſing from the crop, if there is enough of it; if not, ſtraw and hay cut into chaff: as to oats, if the horſes are worked as conſtantly as they ought, they ſhould be allowed two buſhels *per* horſe *per* week, which will be no more than ſufficient to keep them in good heart, and make amends for the loſs

of

of lucern; with this food they may be hard worked every day throughout winter.

But this ſyſtem of feeding is expenſive, and there is a way to leſſen the coſt greatly, which is ſubſtituting carrots inſtead of oats, or, at leaſt, inſtead of the greateſt part of the oats. It will anſwer extremely well to give two buſhels of carrots for one of oats: for inſtance; inſtead of a quarter of oats to four horſes, to give them two buſhels only, and twelve of carrots. The proper manner of giving them, is to waſh them quite clean when uſed, and then to chop them in pieces, and put them into the manger, with plenty of chaff: they will keep the horſes in as good heart as oats, and upon an average, in much better health. If you apply the chief of your carrot crop to other purpoſes, ſtill you ſhould determine to allow a ſmall quantity weekly to all your horſes, for the mere purpoſe of keeping them in good health.

The ox teams ſhould be kept on ſtraw and cabbages, and in default of the latter, on turnips; but cabbages are much ſuperior. Let them have good barley or oat ſtraw always in their racks, and allow them about fifty pounds of cabbages each *per diem*, if they are large beaſts; When you work them very hard, change the ſtraw for hay. The vaſt ſaving of uſing oxen inſtead of horſes, lies in the winter food: an ox, with this management, will do abundance of work; but a horſe could not be ſo managed at all.

Lay it down as a rule to keep both conſtantly at work: there is not in the range of your buſineſs, eſpecially if moſt of your farm be arable, an object that requires more attention, or one which, neglected, will make you ſuffer more ſeverely. It is the cuſtom of ſome farmers to feed their horſes variouſly, proportioned to their work, giving them no corn when they do not work, and many of them only ſtraw; but this is a bad way: for a horſe that is not always kept well, cannot perform much work

work when it is wanted: the beſt way is ever to feed them very well, and keep them conſtantly at hard work.

Cows.

The dairy of cows are now to be taken into the farm-yard, where their food muſt vary according to their ſtate: the dry one muſt be put altogether to hay, and thoſe in full milk, in another yard, to cabbages, which it is abſolutely aſſerted, on experience, will give no diſagreeable taſte to the milk; but they muſt have good ſtraw given with them. Young cattle ſhould be put with the cows in milk, as they cannot be kept too well. On no account, let any of theſe cattle out of the yards; they only poach and damage the graſs fields, and loſe fleſh in worrying after a few mouthfuls of graſs.

Fatting Beaſts.

This is the proper time to take the large fatting oxen, that have had the ſummer's graſs, and put them to turnips, cabbages or carrots: turnips with hay will do; but not near ſo well as cabbages or carrots: both which will fat a large ox as well as any food in the world. You may either ſtall-feed them under cover, or let them be looſe in a ſtraw-yard, well littered in either caſe; and, if the latter, they ſhould have open ſheds to retire under at pleaſure.

This ſaves abundance of labour: for, if the beaſt is ſtall-fed, he will not thrive well, unleſs he is kept quite clean; and they dung and ſtale ſo much in fatting on any of theſe foods, that the quantity of litter they ſoil is ſurpriſing.

This is alſo the month for purchaſing lean beaſts of the ſmaller ſort, for fatting totally on the ſame articles of food, particularly turnips and cabbages. In the months of

of *October*, *November*, *December*, *January*, *February*, *March*, and *April*, they will become as fat as their ſize will admit; that is profitably ſo for ſelling to the butcher. It is this plan of appropriating the turnips and cabbages of a farm to fatting beaſts throughout the winter, in a well-littered farm-yard, that converts the ſtraw, fern, ſtubble, &c. into mountains of dung, and improves the land more than any other method whatever.

Hogs.

Now alſo put your full-grown hogs to fat: a buſineſs as profitable, particularly in reſpect to the improvement of a farm by dung, as any that can be undertaken. In this matter, a farmer (unleſs the price of corn is very low) may take ſome trouble, and yet make no great profit; but I do not conceive, that profit on the hogs can be his view. If he gets the market price for his peaſe, barley, beans, buck-wheat, &c. and ſaves carriage upon them, at the ſame-time getting a fair price for his ſwine lean; he certainly makes a conſiderable profit upon the whole tranſaction, though not an immediate one, as the mere fattener of hogs: but, what is of much greater conſequence, is the raiſing of rich and moſt valuable manure, much better than can be gained by any other means at home; for hog dung far exceeds that of any other cattle. Upon theſe general principles, which I apprehend are ſo juſt, that nobody can contradict them on experience, it is not only expedient to fat the hogs bred on the farm, but alſo to purchaſe others lean, as many as are neceſſary for the conſumption of the peaſe, beans, barley, and buck-wheat of a farm. I ſpeak of ſmall farms and middling ones; not very large ones on a barley ſoil, where that grain is the principal crop. And further, carrots and potatoes are roots that will fat a hog nearly

nearly as well as any grain, and at the ſame time to vaſtly greater profit than any corn or pulſe; for the product of them is ſo very conſiderable, that one acre of land, ſo applied, will go further in fattening ſwine, than many acres of the beſt grain. Let therefore the induſtrious huſbandman every year plant a field of potatoes or carrots for fattening hogs, which will do it to great profit, merely on the ſwine, but much more ſo conſequentially in dung.

Sheep.

October is a proper time for buying in wethers in pretty tolerable order for fattening on turnips and cabbages, which is a very profitable application of the crops. If the land is very dry, it will be adviſeable to herdle off parts of the field, and give them to the ſheep ſucceſſively; but, if the ſoil is at all wet, they muſt be given on a dry graſs field. In either way, you work a very great improvement of the land, either of the field in which they grow, or of the graſs one, in which you feed them. Keep theſe wethers fatting untill April or May, when mutton ſells better than at any other time. This cannot be done on turnips; but on cabbages it is every day practiſed.

Manure Graſs.

This, as well as the preceeding month, is an excellent ſeaſon for ſpreading manure on graſs lands, nor ſhould it be deferred later. In ſome counties, it is an article in the generality of leaſes, that all the dung of a farm ſhall be ſpread on the graſs: but ſuch covenants are totally contrary to the ſpirit of good huſbandry. In the ſame idea is the obliging the farmers to lay a certain number of chaldrons of lime *per* acre on their arable land, to ſerve in lieu of dung. I will venture to aſſert, that all this is moſt execrable management, that it is a remnant of the

ſame barbariſm as making horſes draw by their tails. Lime, according to the beſt chemiſts, is no manure, but a mere forcer: where it meets with fertility to work upon, it forces the land to yield it for the nouriſhment of plants; but, where little ſuch nouriſhment is to be found, it is miſchievous, as it forces the ſoil beyond its powers, and leaves it a *caput mortuum*, until enlivened again with dung, or enriched by other means. Hence the propriety of liming ſuch lands, whoſe nature or management prevent the exhauſting them of their fertility; but thoſe, which can eaſily be hurt by improper management, ſhould never be limed.

The above-mentioned covenants, therefore, are diametrically oppoſite to common-ſenſe; obliging the farmers to dung their graſs, and lime their arable, is a conduct that tends to the utter ruin of the latter; for arable land is eaſily exhauſted with the beſt management. What therefore muſt it be with conſtant forcing by lime, and no dung? This ſyſtem can only have ariſen from ignorance of the qualities of lime. It is called a *manure*: theſe landlords have conſulted the name alone, and ranked it with dung; whereas there cannot be two ſubſtances more unlike. Laying lime on graſs land is very allowable, and a proper manure; for old turf is always rich: the ſurface of roots is like a dung-hill, and it is generally acquiring riches; but, with all advantages of this kind, yet in many paſtures, the burthen of hay is by no means in proportion. Now lime being a forcer, and a diſſolver of vegetable ſubſtances, it forces the ſurface of the ſoil to yield the crop more nouriſhment, and, by diſſolving the old decayed roots, convert them into a manure. Let theſe effects, however, be as great as they may, ſtill it is out of the power of the tenant to exhauſt the land: he can only cut off or eat off the growth; nor will it ever be in his power, though no dung be ever laid on it, nor any cattle ever fed in it, to prevent the ſoil being in the conſtant acquiſition of fertility;

tility; for that is the nature of a thick turf. Thoſe who talk of hurting meadows by chalking and liming, ſpeak againſt all principles. It is ever prudent to let the tenant do what he pleaſes with all his manures: he certainly muſt be the better judge, which field wants it moſt, and which will pay beſt for it. Obliging him to lay lime on his graſs lands would not be objectable: and as a tie, and the only one worth a farthing, ſtate his courſe of crops. Lay a heavy penalty on two crops of white corn coming together; make him hoe all turnips, beans, peaſe, &c. The following courſes exclude a fallow. and yet will always keep the land in good order: they ſuit both light and heavy lands.

1 Turnips. 3 Clover.
2 Barley. 4 Wheat.

And,

1 Cabbages. 3 Clover.
2 Oats. 4 Wheat.

Let it not be imagined, that I am urging any thing againſt the general manuring of graſs lands; on the contrary I am ſenſible, that it is moſt excellent management; but let not all the dung be ſo applied: form compoſts of turf, ditch-earth, marle, chalk, lime, and ſome dung: ſpread aſhes, ſoot, and malt duſt. Such manures are proper for graſs, and will pay well.

Dig up Carrots.

In this month the carrot-crop ſhould be dug up: ſome perſons leave it till *November*; but, in caſe of wet weather, they ſuffer much by the delay. They may be taken up either with three-pronged forks or with ſpades, if the land is not hard, which it will not be, if the crop has been well cultivated; a little looſening of the earth with the tool, and at the ſame time drawing up the carrot by the top, will take them up very quickly. They ſhould be left ſpread over the field till dry, which will be in a day or two:

two: then thrown into heaps and carted home; which moving will clear the dirt from them. Unload them in a barn or ſome out-houſe, and let the tops be chopped off, and given to the ſwine: then lay the roots where they are to remain. Some pile them up in a heap, and cover them with dry ſand, others cover them with ſtraw: they will keep very well, if packed cloſe together in any building; and, if it be only a boarded one, cover them with ſomething, enough to keep out the froſt. Reſpecting the application of the crop, you muſt allow ſome for your horſes, to keep them in good health, in which they are very efficacious. It is commonly ſaid, that carrots will only give them fine ſkins; but that is a mere ſymptom of good health. Swine will pay you beſt for them: you may completely fat your hogs on them, and none will do better, look better, or eat better. Sows that have pigs may be kept on them; for they breed much milk. Oxen will fat to admiration on them; cows eat them greedily, and they give no ill taſte to the milk, cream, or butter. Their uſe, in ſhort, is univerſal: you can cultivate no plant that will anſwer more purpoſes.

Plow up Potatoes.

There is not the ſame reaſon for digging up this crop as for carrots: the plough among the latter is apt to cut, break, and bury them; but not ſo with potatoes: for it turns them over, damaging ſcarcely any; and, though, ſome will certainly be buried the firſt plowing, yet a harrowing will uncover many of them, and a following plowing moſt that remain: ſo that another harrowing will leave not one in a thouſand covered; and the great advantage of this method is the tillage, which thus takes up the crop, preparing the land excellently for wheat, to be harrowed in directly, or for barley in the ſpring; if the latter, let the laſt plowing throw the land on to the ſmall ridge, to remain

remain dry during the winter. If your potatoes are not for immediate ſale, they muſt be laid up in a place ſecure from froſt, which they are more liable to damage from than carrots. You will find it extremely profitable to apply them to winter feeding various ſorts of cattle, particularly hogs; they will fatten on them; ſows with pigs, and weaned pigs; alſo the common ſtock ſwine; all will thrive on them to very great profit.

Lay up the Fallows.

This month muſt conclude the autumnal tillage on all ſtiff or moiſt lands; for, in the following month, they will probably be too wet: but on very light ſandy ſoils, plowing goes on all winter. Now you ſhould finiſh throwing the ſummer fallows, deſigned for barley, on to the ridge, to lie dry during the winter: the ſtubbles for a fallow next year, and thoſe for turnips or cabbages, and the land deſigned for all ſorts of ſpring corn and pulſe, ſhould now be compleated. Lay it down as an invariable rule, never to have a piece of ſtubble unplowed in November. It is of very great importance to leave your land for winter in ſuch a manner, as the froſts will beſt get into it; which certainly is on the narrow ridge, a greater ſurface being ſo expoſed; and the new-plowed ground will admit the influence of the air, of whatever kind, much better than hard-bound ſtubble lands: and by the froſt pulverizing the land, it is in ſo much the better order, either for the crops deſigned, or for a fallow.

Plow for Carrots.

In *October*, the land muſt receive the firſt plowing, that is deſigned for carrots in the ſpring. Fix on the lighter ſoils of your farm; but, if you are in general on a light ſand, chuſe the ſtiffer fields: for larger crops will be gain-

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ed from a light loam, than from very light ſands. Plow as deep as the land will admit, and do not fear of bringing up earth that never ſaw the ſun before, provided it be not of a clung, ſtiff, clayey nature: the deeper you go in ſoil that will crumble, the better; for, as the carrot is all tap-root, it ſtands to reaſon, that it muſt require a very deep tillage. In this plowing, it is of great importance to poſſeſs a good plough, well made for the purpoſe of turning up the earth to a great depth. The farmers, where carrots are cultivated, uſe only their common plough, but go twice in a furrow; but this gains not near the depth that is really requiſite, which is from eighteen inches to two feet: the beſt way would be to make a plough on purpoſe. With a proper plough, four horſes twice in a furrow, or ſix once, will ſtir the land deep enough for the purpoſe. As ſoon as the plowing is finiſhed, water-furrow the land thoroughly, ſo that it may lie as dry as poſſible all winter, and be ready to ſtir the ſooner in the following ſpring.

Let the ſpirited farmer apply much of his land to the culture of carrots; for he will find no article half ſo profitable in his whole farm, as this well conducted. Few men will beſtow attention or expence enough to cultivate this plant on a large ſcale, notwithſtanding the undoubted profit attending it. A ſpirited farmer, that has money in his pocket, will introduce carrots inſtead of turnips, in his courſe, through his whole farm. He ſhould, when his ſoil is proper, totally ſubſtitute them in the room of turnips; for it is no exaggeration to ſay, that one full crop of carrots will pay better than ten of turnips. It is much to be regretted, that better ideas are not more common, of the great profit of certain crops in huſbandry, which, in a few hands, yield immenſe advantages, and would do the ſame in all, if equal attention was given.

ARTICLE

ARTICLE. LXVII.

ABRIDGEMENT OF HUSBANDRY ANATOMISED: By JAMES DONALDSON.

[Continued from our laſt, p. 532.]

CHAP. V.

Of Stock-keeping, and the breeding of Horſes, Cattle, and Sheep.

"THAT which will feed two, will hunger "three," is a proverb in every body's mouth; and yet there is ſcarce any thing leſs believed, if we may take peoples practice for any interpretation of their minds; for as I formerly obſerved, the paſtures thro' the moſt of the kingdom are overlaid, and the cattle in a manner ſtarved. I therefore recommend to all ſtock-keepers, to keep no more cattle than they can plentifully maintain; for two cows well kept will yield more profit than ſix, as they are now commonly kept; and the ſame of all other beſtial.

Thoſe who reſolve to breed horſes, ſhould provide mares of good ſhapes and other good properties; and the ſtallion ſhould be the beſt that can be had. The brood ſeldom fails to reſemble either the ſire or dam; and a foal of a good kind requires no more expence in upbringing than the worſt: Therefore whatever the beſt can be ſold at more than the worſt, ſo much is the profit encreaſed. Mares ſhould be ſerved only once in two years; for a mare that is ſuckling a foal cannot be in good condition to breed one in her belly at the ſame time; and the mare herſelf, and the foal in her belly, are both much weakened; and the foal that is brought up on her when with foal at the time, is always much weaker than that which

which is brought up on her, when not with foal. And therefore if you would have the mare and foal to thrive, this rule ſhould be obſerved.*

I ſhall not repeat what I ſaid concerning oxen and cows in chap iii. only I muſt recommend this principle which cannot be enough inculcated, to keep no greater number than the ground can ſufficiently maintain; and rather to abate three or four of the number than keep one more than enough. What is it that makes cattle in other places taller and ſtronger than they are commonly in this country: But becauſe they are fed more plentifully. Feeding well when young, is a very great mean for ſtrengthening of cattle; therefore the calves ſhould have milk in abundance.†

I come now to ſpeak of ſheep, an animal whoſe univerſal uſe is ſo well known, that it is needleſs to ſpeak in its commendation: For as it is the moſt uſeful, ſo it is likewiſe the moſt beneficial ſtock to the farmer; for not only as they multiply faſter than other cattle, in coming near to their full ſtature in a year's time; but alſo their fleſh is as wholeſome and delicious food as any other: And beſides, they every year yield their fleeces, which in ſome reſpects is the moſt conſiderable advantage; for tho' without them we might be ſupplied in food, I know not how otherways we could be provided in cloathing.

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* See an eſtimate of the expence of breeding horſes. Vol. I. page 321.

† The author here proceeds to give ſome inſtructions concerning the making of butter and cheeſe. But as he acknowledges, he knows but little of the matter himſelf, and what he ſays, is only from the information of others who ſeem not to have known that part of country buſineſs, ſo well as is now generally known to every country good-wife; I thought it unneceſſary to ſwell this abſtract with it. See Vol. I. p. 382.

I ſhall ſuppoſe a farmer to poſſeſs a farm of a certain extent; and, as in the caſe of arable farms, I ſhall firſt enquire into the profit made of it in the preſent method of management, and then what profit may be made by taking another courſe. We need not be nice about the exact bounds or rent of the farm, theſe being ſuppoſed alike in both caſes: All that is made by following the new method more than was formerly is clear profit, providing the charge of ſervants, and other expences, are alike.

Now, ſuppoſe this farm ſhall contain a mile of ground ſquare, which is about 800 acres, where the ground lyes level; but as the moſt of ſheep paſtures are hilly and mountainous, the ſame circumference will contain more: Let us therefore ſuppoſe it to contain 1000 acres, on which we ſhall reckon 4000 ſheep are kept, and 40 or 50 cows beſides; but the profit of theſe I ſhall not now reckon, having conſidered that already: Of theſe 4000 I ſuppoſe 2000 of them to be ewes, reckoning thoſe of a year old into the number, from which 1600 or 1700 lambs may be produced every year, the one half males, the other females: 200 of which he may ſell at twelve ſhillings Scots each, which makes L. 120. I admit that a 100 or 150 may die in the gelding and otherwiſe, when they are young; ſo that at Hallow-day, there may remain 1400: Now, as in moſt places, not only the lambs, but the old ſheep are fed on very bare paſture, but the lambs are weaned before they are a month or ſix weeks old, whereby they are kept in a very lean condition; and winter approaching, the natural growth of graſs failing, and no other paſture provided for them in winter, but that whereon they fed in ſummer; we may judge how they can ſubſiſt, eſpecially in ſtorms of froſt and ſnow, when for a month together, or perhaps

longer, the fields and hills are totally covered: It is rare to ſee a ſtock of ſheep kept after this manner, but a ſixth part of them dies every winter; but I ſhall ſuppoſe only 400 to be loſt, which is not a tenth part. Before winter, 1000 of the ſheep are ſold at three ſhillings ſterling a piece; *Inde* L. 1800 0 0

The wooll of the whole 4000 ſheep and 1400 lambs may be reckoned over-head at a pound weight each; but call it 345 ſtone, which is a little more, which cannot be valued at above L. 6 the ſtone; *Inde* 2070 0 0

To which add the price of the 200 lambs ſold 120 0 0

Total L. 3990 0 0

What other profits may be made upon this farm from ewes milk, or from the other cattle, I paſs over, and ſhall allow it to go to defray the expence of tar and greaſe for the ſheep, ſervants wages, &c. And if that ſhall not be ſufficient, I ſhall do the ſame in ſtating the produce of this farm in the way I propoſe it ſhould be kept; ſo as the one may ballance the other.

Now, upon this ſame farm, in place of 4000, I propoſe only 2500 ſheep to be kept; and their increaſe I ſhall reckon proportionally with the former; though as they have near double the paſture, they will certainly be in better condition, and conſequently more fruitful. However, taking it ſo, if 4000 yielded an increaſe of 1700, then 2500 will yield 1062, or a round 1000, diſcounting the odds for Lambs that may die young. The ſtock then is 2500 ſheep and 1000 Lambs. For theſe I would have huts built; and

and ſo large that they may have ſufficient room to lye at eaſe and have room to breathe; for too much heat may hurt them; and to prevent that, little holes or windows ſhould be made in the walls. This will preſerve them from rain, and ſave their dung, which is a very great benefit.

The ground I propoſe ſhould be ordered thus. Two hundred acres of the paſture ſhould be incloſed, and hained till after Hallowday. Thirty acres to be laid up in meadow for hay. And one hundred and twenty to be appropriated for crofting or corn land.

The laſt will be reckoned the moſt difficult; but if it is ſo mountainous that it cannot be plowed at all, it may be made very fertile, and there are few farms of that extent but may afford one or two hundred acres that may be made arable. As the ſheep are to be put in cotts every night during the winter, and in ſummer too, if they are not folded, they ought to be well bedded and littered, which muſt by no means be neglected, and every one of them will make a cart-load of dung in the year, which I value at fourteen ſhillings Scots the load: This is 3500 cart loads, which will ſufficiently dung thirty-five acres at 100 loads per acre. But ſeeing the ground is naturally cold, I ſhall allow ſix ſcore to each acre, which is as good as nine ſcore of common dung; and the above quantity will ſerve thirty acres, the ſtrength of which will remain good for four years; So that in four years time the whole 120 acres is gone over with dung. But if this ſhould not be reckoned ſufficient, let the dung of the other cattle, that is a dozen horſes or oxen that perform the labour, and forty or fifty nolt be added: And notwithſtanding this extraordinary dunging, I ſhall not reckon the produce to

be

be more than ſeven bolls per acre, that is, in bolls,		840
A hundred bolls will ſerve for ſeed according to what is before obſerved, p. 476.	100	
Horſe corn according to the former calculation	48	
Meat and wages to ſix men kept for labouring the ground.	100	
Let L. 200 be allowed for ſhearers wages, This converted into bolls.	40	
		288
There remains	bolls	552

Which being reckoned at L. 5 per boll is L. 2760

I charge nothing for the other ſervants needed to manage the other parts of the farm, having omitted it in the former caſe; ſo the one is ballanced by the other.

The thirty acres appropriated for meadow or hay, is to preſerve the ſheep in ſtorms and caſes of extreme neceſſity when the ground is covered with ſnow; but if there is no natural meadow on the farm, is by ſowing as many acres of the corn ground with clover and graſs-ſeeds, which is to be done about eight days after the corn is ſown, and the ground made as ſmooth as poſſible, and harrow it in with your harrows filled with thorns, to prevent the teeth of the harrows from going into the ground, leaſt thereby the mould be raiſed too high above the graſs-ſeeds, ſo as to bury them; whereas if the thorns are tied regularly in, it will ſmooth a thin mould over the ſeed. So that year you have your crop of corn, as if nothing elſe was upon the ground; and next year, the clover and graſs will grow up plentifully, and may be mowed two or three times. I need not here ſhow how much hay may be made on each acre, or how many ſheep may eat a ſtone of hay in a day; for I think it will not be queſtioned that the

the quantity of hay that will be made will ſerve this ſtock of ſheep in caſes of urgent neceſſity. But if the ground is ſo mountainous, that it cannot be plowed to anſwer the purpoſe of corn land, it may nevertheleſs be made into hay, by laying dung upon the graſs, or folding the ſheep or other cattle on the place intended; and when it is well puddled and dunged by the feet and dung of the beſtial, ſow it with graſs-ſeeds and harrow it as before directed.

This hay ſhould be placed before them in racks, for if it is thrown upon the ground, a great part of it will be loſt by their trampling it among their dung. Some place their racks in the middle of the ſheep cotts; but this I diſcommend; for if the racks are placed ſo low, that the ſheep can eat conveniently out of them, then the wool is torn off their backs, by going through below them. I judge it moſt convenient to have them placed upon the wall.

The field of two hundred acres that was appointed to be hained all ſummer, is not to be touched till November, when the ſheep are to be put upon it, or ſooner perhaps if the other paſtures are bare: And by thus prudently providing food for the ſheep in winter, they will be much ſtronger and more healthy than thoſe kept, as was formerly ſuppoſed; and conſequently their lambs will be fatter and larger; for how can it be thought, that a ewe, lying all winter among froſt and ſnow at the point of ſtarving, can in the ſpring bring forth a lamb in good condition; we may therefore reckon them a third better than thoſe kept as formerly.

Their wool will likewiſe be as much improven as themſelves. When other beaſts are fat and in a good condition, their hair is viſibly much ſofter and ſmoother. Obſerve, what difference there is in the hair of a horſe that is well

fed

fed and kept, and that of a horſe that is ſore wrought and ill fed; and ſo of all other beaſts: And as wool is the hair of this animal, why ſhould it not improve by good keeping as much as that of others. I doubt not, if ſheep were fed as plentifully in this country as elſewhere, but the wool might be equally good and fine, and the produce as great.

Now, let us ſee what the produce of this ſtock may be.

The produce of corn is reckoned worth		L. 2760
A thouſand lambs were ſuppoſed to be produced every year, beſides thoſe dying young, 100 may be ſold in April or May, at 18 ſhillings a-piece, is	L. 90	
400 of the oldeſt and weakeſt ſheep may be ſold at Hallowday at L 2 each, is	800	
400 ſhould be kept upon the beſt hained graſs, which may be ſold betwixt Candlemaſs and May at L. 4 each, is	1600	
This wool of the whole ſheep and lambs, was formerly reckoned a pound weight each over head; now it may be reckoned a quarter of a pound more, that is 4375 lb. of wool, or 273 ſtones, ſome odd pounds, reckoning this at L. 9 per ſtone, is	2457	
		4947
Total produce:		L. 7707
The produce of this farm under the former management, as on p. 574.		3990
Difference in favour of the improved Scheme of management.		3717

[*To be continued in ſome future* NUMBER.]

ARTI-

ARTICLE LXVIII.

Reflections upon the great Advantages of EXPERIENCE *to a* FARMER.

[In a Letter to the PUBLISHER.]

IF the following thoughts can be of any ſervice to your publication, though they do not perhaps tend directly to teach any particular part of Farming, you are very welcome to uſe them.

Experience without doubt is the beſt teacher; but it would require an uncommon exertion of the logical powers, to deduce from this axiom, that our agriculture is incapable of improvement from the reciprocal communications of the obſervations made and ſtill making by the practical farmers, ſince every ſyſtem of it, however complete, hath taken its riſe in this very way: Yet many ſeem to think themſelves exceeding wiſe, when they baul out this as the moſt natural conſequence that can flow from a firſt principle. None, I dare ſay, would ſcruple to give the preference to that knowledge which he acquires by his own particular ſtudy and application, ſince in proportion to the difficulty of acquiring it, it is rivetted upon his mind, and is always the more ready when neceſſary to call it forth to action But who would be ſo ſelf-conceited, as to bar his mind againſt the entry of every other piece of knowledge, becauſe perhaps it was diſcovered by ſome other perſon, or that, in paſſing thro' the preſs, it has aſſumed the air of Speculative.

A practical Farmer, however much inclined to trudge on in the old beaten path in which his father trode, will lend a greedy ear to converſation, and be even ready to adopt whatever plan of management he can find preferable to his own, when taught him in a plain ſenſible manner; and yet will

will be much averſe to read the moſt rational account of an experiment, when committed to paper. I muſt indeed allow, that, beſides the want of a glaſs, which commonly accompanies the laſt mentioned mode of communication, there are ſome other circumſtances peculiarly unfavourable to it. Objections cannot be ſo quickly anſwered: Hence the pleaſing ſucceſſion of knowledge which attends converſation, is almoſt loſt in this. Anonymous writers too may be careleſs in making experiments; and though they are not, how is the farmer to rely upon what they ſay as genuine, when not acquainted with their characters as farmers: Add to all this, the unſeaſonableneſs of reading for a plodding farmer, having but juſt finiſhed the toilſome labours of the day. Who, think you, in this ſituation then, could ſubmit to ſuch a taſk, as the reading your SCOTS FARMER muſt be, to one who would not even ſwallow the moſt ſalutary counſel of a friend, unleſs adminiſtred in a bottle of Two-penny or brown October? Delightful potion! would he ſay, who would not ſubmit to the loweſt drudgery of the field, to be able to reliſh thy cooling draughts? Thus far, however Mr Printer, the objections againſt printed inſtructions are but frivolous; but there are others of a more ſerious nature, and which it is the buſineſs of this letter as far as poſſible to remove.

The vaſt number of books upon Agriculture already iſſued out, under the pompous titles of *A Compleat Body of Agriculture*, &c. were at firſt bought with much keenneſs, and read with a degree of attention peculiar to thoſe who would willingly improve by ſuch aſſiſtants: But their plagiary authors knowing nothing of the ſubject themſelves, having made a very injudicious choice of materials from other books, where but ſcanty gleanings could be got, ſo bewildered and perplexed the underſtanding of their readers, that they

they ſoon gave general diſguſt at every thing which had but the appearance of their pretended inſtruction. Many treatiſes of agriculture have of conſequence been ſpurned from the indiſcriminating multitude (for whoſe purpoſe your pamphlet was chiefly intended), with that contempt which they thought they ſo richly deſerved: I ſhall endeavour, in the ſequel of this letter, to ſhow the abſurdity of maintaining theſe prejudices againſt all oppoſition.

No man can acquire, of himſelf, that degree of knowledge, even thro' a long life-time, which he can do by comparing the different practices of the country in general, with their various ſucceſs: It is certain he cannot truſt implicitely to the reſult of his own experiments, when he finds it contradicted by the general experience of the country. Experience, owing to hidden cauſes, or the inattention of the enquirer, will oft ſeem actually to declare things inconſiſtent with one another, with herſelf, or the language ſhe ſpeaks univerſally to the world; and who could pretend to that wiſdom and ſagacity that is neceſſary in making experiments, and diſcovering upon the firſt trial the genuine reſult of them? How often will he be ready to aſſert, with experience in ſome inſtances, that the wetter his peaſe-land at ſeed-time the more certain is the farmer of a crop of peaſe; and in another inſtance, that the ſteering of the bear-land is an unneceſſary practice, ſince even by different trials, perhaps he knows it for certain, that the unſteered carries better crops, when it is no more but ſome accidental rain, at an unfavourable ſeaſon for the barley, which was the cauſe of it. I ſhall add but one other inſtance more: How often would he be ready to aſſert, in conſequence of a few years obſervation, that it is altogether unneceſſary to pickle wheat in order to prevent the black with which it is often infeſted; tho' the general experience of the country can declare this a manifeſt error:

Hardly will the experience of twelve or twenty years convince ſome of the neceſſity of applying this remedy; though having it but once in any of theſe times will be more loſs, than the expence of pickling through a very long tack. Since then, from the variety of circumſtances to be conſidered, and the compariſons to be made in diſcovering the genuine reſult of experiments, the mind is ready to be perplexed, and to draw falſe concluſions; ſince it is impoſſible for any perſon to acquire that knowledge by himſelf, which he can by the aſſiſtance of his neighbours; it appears of conſequence to have clubs eſtabliſhed, and periodical papers circulate, for the benefit of the Farmer and of his country.

Eaſt Lothian, I am, SIR,
Sept. 26. 1774. Yours, &c. ARATOR.

ARTICLE LXIX.

The Effects of ELDER, *in preſerving Growing Plants from Flies and Inſects.*

[In a Letter from CHRISTOPHER GULLET, Eſq; of Taviſtock, in Devonſhire, to Dr MATY, Secretary to the Royal Society.]

SIR,

I Should not preſume to trouble you, as a member of the Royal Society, with the following letter, did not the ſubject ſeem to promiſe to be of great public utility. It relates to the effects of Elder;

Sambucus fructu in umbrella nigro.

1ſt, In preſerving cabbage plants from being eaten or damaged by caterpillars.

2nd, In preventing blights, and their effects on fruit and other trees.

3d, In

3d, In the preſervation of crops of wheat from the yellows, and other deſtructive inſects.

4th, Alſo in ſaving crops of turnips from inſects, &c.

1ſt, I was led to my firſt experiments, by conſidering how diſagreeable and offenſive to our olfactory nerves the effluvia emitted by a buſh of green Elder leaves are; and from thence reaſoning how much more ſo they muſt be to thoſe of a butterfly, whom I conſidered as a being as much ſuperior to us in delicacy, as inferior in ſize. Accordingly I took ſome twigs of the young Elder, and with them whipt the cabbage plants well, but ſo gently as not to hurt them, juſt as the butter flies firſt appeared; from which time for theſe two ſummers, tho' the butterflies would hover and flutter round them like gnomes and ſylphs, yet I could never ſee one pitch, nor was there I believe a ſingle caterpillar blown, after the plants were ſo whipt; though an adjoining bed was infeſted as uſual.

2d, Reflecting on the effects above-mentioned, and conſidering blights as chiefly and generally occaſioned by ſmall flies, and minute inſects, whoſe organs are proportionably finer than the former, I whipt the limbs of a wall plumb-tree, as high as I could reach; the leaves of which were preſerved green, flouriſhing, and unhurt, whilſt thoſe not ſix inches higher, and from thence upwards, were blighted, ſhrivelled up, and full of worms. Some of theſe laſt I afterwards reſtored, by whipping with Elder, and tying it up among them. It muſt be noted, that this tree was in full bloſſom at the time of whipping, which was much too late, as it ſhould have been done once or twice before the bloſſom appeared. But I conclude, from the whole, if an infuſion of Elder was made in a tub of water, ſo that the water might be ſtrongly impregnated therewith, and then ſprinkled over the tree, by a hand engine, once every week or fortnight, it would effectually anſwer every purpoſe that could be wiſhed, without any poſſible riſk of hurting the bloſſoms or fruit.

3d, What

3d, What the farmers call the Yellows in wheat, and which they conſider as a kind of mildew, is in fact (as I have no doubt you well know) occaſioned by a ſmall yellow fly with blue wings, about the ſize of a gnat. This blows in the ear of the corn, and produces a worm, almoſt inviſible to the naked eye; but being ſeen through a pocket microſcope, it appears a large yellow maggot, of the colour and gloſs of amber, and is ſo proiifick, that I laſt week diſtinctly counted forty-one living yellow maggots or inſects in the huſk of one ſingle grain of wheat; a number ſufficient to deſtroy and eat up the corn in a whole ear. I intended to have tried the following experiment ſooner, but the dry hot weather bringing on the corn faſter than was expected, it was got, and getting into fine bloſſoms, ere I had an opportunity of ordering as I did; but however, the next morning at day-break, two ſervants took two buſhes of Elder, and went one on each ſide of the ridge, from end to end, and ſo back again, drawing the Elder over the ears of corn of ſuch fields as were not too far advanced in bloſſoming. I conceived, that the diſagreeable effluvia of the Elder would effectually prevent theſe flies from pitching their tents in ſo noxious a ſituation; nor was I diſappointed, for I am firmly perſuaded, that no flies pitched or blowed on the corn after it had been ſo ſtruck.—But I had the mortification of obſerving the flies (the evening before it was ſtruck) already on the corn, (ſix, ſeven, or eight on a ſingle ear) ſo that what damage had accrued, was done before the operation took place; for, on examining it laſt week, I found the corn which had been ſtruck pretty free of the yellows; very much more ſo than what was not ſtruck. I have therefore no doubt but that, had the operation been performed ſooner, the corn would have remained totally clear and untouched.

If

If ſo, ſimple as the proceſs is, I flatter myſelf it bids fair to preſerve fine crops of corn from deſtruction, as the ſmall inſects are the crop's greateſt enemy. One of thoſe yellow flies laid at leaſt eight or ten eggs, of an oblong ſhape, on my thumb, only while carrying by the wing acroſs three or four ridges, as appeared on viewing it with a pocket microſcope.

4th, Crops of turnips are frequently deſtroyed, when young, by being bitten by ſome inſects, either flies or fleas: This I flatter myſelf may be effectually prevented, by having an Elder buſh ſpread ſo as to cover about the breadth of a ridge, and drawn once forward and backward by a man over the young turnips. I am confirmed in this idea, by having ſtruck an Elder buſh over a bed of young colly-flower plants, which had begun to be bitten, and would otherwiſe have been deſtroyed by thoſe inſects; but after that operation it remained untouched.

In ſupport of my opinion, I beg leave to mention the following fact from very credible information, That about eight or nine years ago this county was ſo infeſted with cock-chaffers, or oakwebs, that in many pariſhes they eat every green thing, but Elder; nor left a green leaf untouched beſides Elder buſhes, which alone remained green and unhurt, amid the general devaſtation of ſo voracious a multitude. On reflecting on theſe ſeveral circumſtances, a thought ſuggeſted itſelf to me, whether an Elder, now eſteemed noxious and offenſive, may not be one day ſeen planted with, and entwiſting its branches among fruit trees, in order to preſerve the fruit from deſtruction by inſects; and whether the ſame means which produced theſe ſeveral effects, may not be extended to a great variety of other caſes, in the preſervation of the vegetable kingdom.

The dwarf Elder (*ebulus*) I apprehend emits more offenſive effluvia than common Elder, therefore it muſt be preferable to it in the ſeveral experiments.

ARTI-

ARTICLE LXX.

Uſeful Hints, Obſervations, &c. relating to AGRICULTURE; *And ſome of the Mineral and Vegetable Productions of this* ISLAND.

THERE are few things that could be made clearer, if we depended only on authority, than that there have been many rich ſilver mines in England; ſince we have not only credible hiſtories, but authentic records alſo which atteſt the fact. Yet, if we admit theſe, we muſt take this term in a general ſenſe, for mines affording ſilver, and not in the uſual reſtrained ſignification of mines producing ſilver ore. This ambiguity was introduced by the ſtate of our conſtitution in former times; for then all mines holding either gold or ſilver, which might be extracted to profit, were allowed to be mines royal, and paſſed in a common, or rather in a legal acceptation, for gold or ſilver mines. It was in conſequence of this, and of the methods taken to ſupport the prerogative of the Crown, that our mines were ſo indifferently known and ſo little wrought, as, by the removing of theſe impediments, they have been within leſs than a century ſo much improved; ſo that at this time we have actually more ſilver extracted from our lead than ever, though we hear nothing more of ſilver mines. It is, however, indiſputably true, that ſome pieces of pure ſilver are now and then found in our copper, lead, and tin mines. But, notwithſtanding this, and the ſuperior ſkill of our artiſts in aſſaying, we have not hitherto diſcovered any ſuch thing as ſilver ore, which is what properly conſtitutes a ſilver mine. But this by no means proves there are none in the iſland, or ought to diſcourage a ſearch for them.

The wiſe Lord Verulam exceedingly regretted the exportation of lead and of lead ore to foreign parts, or even its being conſumed at home, without extracting the ſilver; and with too much reaſon. In his time the annual produce

of

of our lead mines was eight thouſand tons, which, at the moderate computation of twenty ounces in a ton, would, in the ſpace of a century, even ſuppoſing we had raiſed no more than we then did, have ſupplied us with four millions of our own ſpecie.

Might not charred turf, or Dutch turf, that is made and dried as the Dutch turf is, ſupply, where neither can be had, the place of wood or coal? Dutch turf has been uſed by ſilver-ſmiths here. Would not culm, mixed in the making Dutch turf, produce a ſtrong fire? Has the charring pit-coal been properly attended to, or its effects ſufficiently examined?

Not above two centuries ago, it is worthy of remark, ſome of the wiſeſt men in the kingdom doubted the poſſibility of rendering this iſland ſo fertile in corn, as not to be in a continual ſtate of dependence in this reſpect on its neighbours. On this principle, they oppoſed laws for promoting agriculture, as oppreſſive and vexatious to the people, as directing their views to an object which their utmoſt induſtry could never attain.

Agriculture is the great ſupport of the nation, in which every individual is intereſted, for the moſt material articles of his daily ſubſiſtence in food and in drink: in this reſpect all manufactures depend upon it; from its produce it is the chief ſtay of the landed intereſt; it contributes largely to navigation and commerce, in various ways; and taking all theſe together, to a vaſt amount towards the maintainance of government. All theſe benefits, important as they are, become exceedingly more ſo, from the conſideration that they are ſtable and permanent, the work of prudence and perſeverence, and which can never decline but through indolence and folly.

The French now very wiſely and ſucceſsfully practiſe a huſban-

huſbandry which they learned from us. They ſplit the ridges of wheat-ſtubble, and ſow it with rye, which in April and May they cut for their black cattle (whereas we feed ſheep and lambs), and if the weather proves favourable, they mow it three times, which at that ſeaſon is highly beneficial.

Experience is the Farmer's only guide, and yet he can ſeldom ſpare time or money to make experiments: The Society of Arts, Manufactures, &c. by their premiums, have removed, at leaſt in a great meaſure, this difficulty; in doing this they have done more than was ever done towards promoting the progreſs of agriculture, and thereby merit highly of their country.

There is a wide difference between an improvement's being known and publiſhed, and its coming into general uſe; in reſpect to which a hiſtory of Britiſh huſbandry would be of great utility.

The trials made by Dr Hill in regard to the Norway turnip, which grows to a large ſize on hillocks raiſed on bogs, deſerve attention. This, though of no great conſequence in a fertile country, may be found of great utility in moors and moraſſes, till they fall into the hands of ſuch as can afford to drain and cultivate them in a better manner. All experiments of this nature ought to be made as much known as poſſible.

The Romans boiled and eat the green leaves of turnips, as has alſo been done by our peaſants in hard froſts. In times of ſcarcity they formerly boiled turnips, and after preſſing, kneaded them, with an equal quantity of wheat flour, into what was called turnip bread. The many uſes to which they are applied in medicine are well known, and ſtrongly ſupported be experience. This root, from what has been diſcovered of it, furniſhes an admirable precedent for future improvements.

THE SCOTS FARMER,

NOVEMBER 1774.

ARTICLE. LXXI.

FARMERS KALENDAR.

Farm-Yard.

THIS month you begin to experience the conduct of the farm-yard, on the principles already laid down. Obſerve now to keep all your cattle confined: let none of them wander about the fields, where they can get nothing to eat; but, if it proves wet weather, will do much miſchief by poaching. Litter all the yards completely from your ſtacks of ſtraw, ſtubble or fern: ſo that, be the ſeaſon ever ſo wet, the cattle may not tread into the layer or bottom of marle or earth, nor ever lie wet. As faſt as the litter is trodden into dung, or becomes quite wet, cut freſh ſlices down from your ſtacks, and ſpread it about. Have an eye to the horſe-keepers, that they uſe plenty of litter: alſo that your fatting-ſtalls, cow-houſes, ox-houſes, hog-ſties, &c. be all kept quite clean littered; for this is the beſt and cheapeſt way of raiſing manure.

If your head-lands or head-rigs are too high, which is frequently the caſe from the Plough turning upon them; or if the ſides of the fields are over-grown with rubbiſh, ſuch as thorns, brambles, thiſtles, and other trumpery; all ſuch rubbiſh, when the hedges and ditches are firſt repaired,

paired, ſhould be grubbed up root and branch, and the earth from the top of the head-lands, dug as many ſpits deep as neceſſary to lay the whole on a ſlope for the field, ſo that the water from the water-furrows may every where have a fall to go off, either into the ditch, if on that ſide, or quite to the bank of the hedge, if on the other. The earth, thus dug up, ſhould be laid into a high ridge along with the ſcourings of the ditches, ready for carting; and the beſt uſe that can made of it, is to carry it into the farm-yard, at the proper ſeaſon, to form the layer now recommended: But if the diſtance is too great for this uſe, then it is a good way to mix it up with lime, and ſpread it on the neareſt graſs field. Lime certainly has a great uſe in mixtures of this ſort; for it diſſolves all the numerous little roots and fibres, of which this earth is full, and prepares them for becoming manure: it alſo takes off that fourneſs, which is found in freſh earth of any depth, it likeways pulveriſes in a ſurpriſing manner. If enough of it is laid on with ſuch earth as this, it will unite with every particle of it, and raiſe ſuch a fermentation, that the whole maſs ſhall be found like running ſand, and in fine order for ſpreading even on graſs-land, where it will be very beneficial. By this piece of good huſbandry, you effect ſeveral excellent purpoſes: you gain ſome land, you drain the fields, and alſo manure them. The whole is a ſyſtem of neatneſs and profit, and ſuch as no good farmer ſhould ever omit.

Threſhing.

As Soon as the cattle are taken into the yards, the threſhers muſt be ſet to work, to ſupply the lean beaſts with ſtraw, and they muſt be kept cloſe and regularly to it; and you ſhould obſerve well, that your ſtock of cattle be proportioned to the quantity of your ſtraw, that they may be carried through the winter on it; conſequently the

the number of threſhers muſt be appointed upon the ſame plan; but this exactneſs is not requiſite, if you are ſo ſituated as to have a command of ſtraw at all times, when you want to buy it.

Fences.

This is the firſt month for hedging and ditching: October is too ſoon. After you have once brought your fences into good order, which ſhould always be effected within the three firſt years of a leaſe; the beſt way is, to divide the length of hedging into twelve parts, and to make it a rule to do one twelfth every year afterwards; by which means the whole will always be kept in good order. The beſt method is the plaſhing, in which ſo much of the hedge is made of live wood, that it holds up and laſts far longer than hedges made all of dead wood, which is the practice of ſome countries; but they are rotten, broken down, and gone, before the quick wood gets up to form a fence; whereas, in the plaſhing method, by leaving as many hedge ſtakes alive as poſſible, and by laying down much growing wood, the fence is conſtantly impenetrable.

The article of hedging and ditching is too much ſlighted by moſt farmers, who do no more than they are bound to by their leaſes, and, were it not for that tie, would do none; but the utility, and even profit (if avoiding loſs may be called profit) of having all the fences in ſuch good order, as to be depended on for ſecuring the crops, is very great. There is not a more troubleſome, and in many caſes a more expenſive conduct, than ſuffering cattle, for want of good fences, to break into one's own, or others crops of corn, hay, turnips, &c. The farmer, who is not ſecure of his fences, never knows where to find his cattle.

cattle. Let therefore the induſtrious huſbandman, who would carry on his buſineſs with any commendable ſpirit, take good care to allot money enough to this object, when he hires his farm, that he may be able to get his fences into good order within the three firſt years of his leaſe: and, in this work, let him dig deep and wide ditches, which add prodigiouſly to the ſtrength of the hedge. However well the hedges of a farm may be made, ſtill they are eaſily paſſed and damaged, if not defended by a ditch. Another great uſe of them is to ſerve as main drains about a farm: they cut through the ſprings, and are ſo many courſes for all external water, draining land greatly, if there are no hollow drains made; but, if ſuch are executed, then the ditches are of excellent uſe to direct them into, that the water may be carried clean off the farm, without the expence of making large drains on purpoſe.

Folding.

In caſe this month proves wet, you muſt leave off folding the arable lands, and begin with the dry graſs fields. The farmers in general ſtop about this time for the whole winter: but that is very bad management: their idea, that winter folding is of but little uſe, is totally a miſtake, as the eaſieſt experiments every day to be made will fully evince. Winter is the proper ſeaſon for manuring graſs-lands, which you could not fold in ſummer, had you ever ſo many ſheep; nor does winter-folding, on very dry graſs-land, do any harm to the ſheep, as many gentlemen with very fine flocks have fully experienced. The benefit to the land is ſo great, that it is ſurpriſing more common farmers do not practiſe it; the moſs, that great enemy to natural paſtures, is completely deſtroyed by it, and ſuch a luxuriance of graſs ſucceeds, that the moſt ample manuring,

auring, by any other way, will not equal. You may manure moſſy ground often, before you deſtroy it; but the treading of the ſheep, at the ſame time that the dung and urine are dropt, completely deſtroys it; and this manuring is more adapted to turf, than any dung to be ſpread on the ſurface, which is always troubleſome to get in.

The Teams.

This is an idle month for the teams in many farms; but ſhould not be with good huſbandmen: for, as I have often remarked, they muſt be conſtantly well fed, and employed, or loſs will be the conſequence. There are many works that may be executed in this month: on light dry ſoils, the marle, chalk, or clay carts ſhould not ſtop; they may work from the firſt day till the laſt. In wetter ſoils, you may cart any ſort of manure on to graſs lands, provided you uſe ſmall carts with nine-inch wheels; the great utility of which is the opportunity of carting on graſs-land through all the winter without poaching.

And, in caſe of no work of this ſort, then the teams ſhould be conſtantly employed in bringing purchaſed manure from the neareſt towns; which work will receive no interruption from the carrying out of products, as manure may be brought back, inſtead of coming home empty. All ſorts ſhould be purchaſed that can, ſuch as horſe-dung, cow-dung, hog-dung, pigeons and poultry dung, coal-aſhes, ſoot, malt-duſt, lime, curriers ſhavings, tanners bark, hair, and lime, &c. &c and whatever others can be had: all ſhould be thrown into one heap, and mixed together, before they are ſpread on the land. This huſbandry will pay a farmer extremely well; but it is too much neglected by moſt of them.

Draining.

Draining.

In this month you may begin the work of hollow draining, which, on wet lands, is the *ſine qua non* of huſbandry. It is in vain to think of farming them to any profit, without this improvement. Manuring, before this is done, is but expending money for five *per cent.* advantage, where fifty ought to be the return. Lay your land dry before you attempt other improvements: the firſt ſtep is cutting deep and large ditches around the wet fields; then you gain a requiſite fall to take the water clean away from the drains. It is highly neceſſary, if your ſoil is ſuch as to allow it, to cut the ſmall drains with a draining plough, of which two or three are invented, and now eaſily to be had. The difference in the expence between plowing and digging them is very great: they may be plowed for a fifth of the coſt. If you have any quantity of land to drain, it is therefore very adviſeable to provide one of theſe ploughs. If the ſoil is very wet, it will be neceſſary to cut the drains pretty near each other; for inſtance, about a perch, a perch and a half, or two perches aſunder: by which means it will be laid in moſt dry and wholeſome order. Fill them with whatever materials you can get the eaſieſt, buſh faggots, ſtones, bricks, &c. &c. No improvement in agriculture is greater than what is effected by theſe drains, nor any that will ſooner repay the expences. In many parts it is well known, that the firſt arable crop will repay the whole expence, which is a profit not be reaped in any other article, to which a man can attend.

Water Meadows.

In this month you may begin to water your meadows and paſtures, wherever it can be done; and be aſſured, that no improvement will pay better: a winter's watering will

will anſwer in the hay, fully equal to a common manuring of the beſt ſtuff you can lay on the land; and the expence in ſome ſituations, is nothing, in others very trifling. The lower parts of a farm are generally in graſs; the farmer ſhould attend to his ditches, ſo that the water, from all the higher parts of the farm, may have an unobſtructed courſe to a ditch a little above the bottom, from which it may be let at pleaſure over the meadows, obſerving that it only runs over them and does not ſtagnate. All this is in numerous farms to be effected with very little trouble or expence, and yet thouſands of farmers never take any heed of ſuch advantages; but, on the contrary, many of them are at an expence to deepen ditches, merely to carry away the water, and prevent its floating any of the graſs. Such ideas are all the reſult of the antipathy, which the common farmers have to experiments: they hate to try the effect of any thing out of the common road; would much rather be at an extraordinary expence, in purſuing the beaten path, than jog an inch out of their way, though to ſave hundreds.

Walling.

In the dry ſtony countries, walls are the common fence; and when well made are impenetrable, and extremely durable. This is the proper ſeaſon to begin building them; they are made of whatever ſtone is moſt plentifull. It is the peculiar happineſs of ſuch tracts in the circumſtance of thoſe ſtones which are of prejudice on the land, being convertable, not only into fences, but alſo houſes, barns, and all other offices. If the ſtones are very unequal in ſize, and not eaſily cut, which is the caſe with whin-ſtones, it will be neceſſary to build the walls wider at bottom than at top, gradually diminiſhing till it comes to a mere edge; but grit-ſtone, or free-ſtone, cuts with ſo much eaſe, that you

you may build walls of it without morter, as true as with it; and if well laid, they will laſt as long. In the incloſing of waſtes, it is proper, by all means, to begin the walling in this month, and continue the work all winter. In all countries, where walls are the common fence, there is a fixed price per perch for the whole work. In theſe undertakings, it is always proper to proportion the ſize of the incloſures, to the ſtoneyneſs of the land; for when the ſtones are pretty thick on the ſurface, they muſt be all removed before it can be cultivated. The building ſhould be fixed in the moſt ſtoney part, near the center of the new incloſures, and, the walling being traced through thoſe parts that are moſt ſtoney, the whole land may be quite cleared of theſe enemies, and all be applied to a moſt convenient uſe.

But it ſhould here be obſerved, that the generality of wall incloſures are very deficient in one circumſtance, pardonable in the undertakings of a farmer, but not to be execuſed in thoſe of a gentleman: it is, the truſting ſolely to walls, and never planting white thorns. The wall ſhould never be eſteemed as any thing but a temporary fence, not from a want of durability, but ſhelter: Walled incloſures are generally made in high, open, bleak ſituations, where ſhelture is as much wanted as incloſure: walls ſhelter very poorly, the wind either driving through them, or reverberating and cutting the cattle with a borrowed keenneſs. Hence let the incloſers of waſtes determine on the ſmall extra-expence of planting quick-hedges againſt all their walls, that hereafter the fields may be more protected from the cold winds, than they can be by means of walls alone. But, if it does not ſuit them to follow this plan with all the ſubdiviſions, at leaſt let them double-wall the outſide fence, and, leaving a ſpace a few perches

perches wide between, plant it thick with whatever trees ſuit the ſoil beſt. Spruce firs are in general to be preferred in bleak ſituations; becauſe they yield a better defence againſt the wind than moſt other ſorts.

Dg Manures.

All this month the carts ſhould be employed in carrying marle, chalk, clay, or ditch earth, upon ſoils that are light enough to admit carting on through winter. On large farms in ſandy countries, that are hired with a view to ſuch improvements, it is a very favourable circumſtance, that you are not obliged to ſtop ſuch works, becauſe of winter; but, in richer ſoils, proper management will remedy this evil. The manure ſhould be laid on old clover-lays left on purpoſe, and ſmall three-wheeled carts uſed, with nine-inch wheels; by which means you may, without cutting or poaching, cart all winter.

Cut Ant-Hills.

This is the proper ſeaſon for deſtroying ant-hills. Many ploughs have been invented for cutting them off level with the ſurface of the field, ready to be carted away; and, if that is the way you take with them, ſuch machines are of great uſe, for they will certainly do the work of many men; but I think the common method uſed by the farmers in general is preferable: the men open the ant-hill with three cuts of a ſharp ſpade, ſkinning the turf, ſo as to lay the heart bare: they then with another ſtroke cut out the heart in a round, or rather triangular form, leaving the bottom of the hole, from whence it came, lower than the field. In this manner, they leave it for a month or ſo, that the rains may collect, and kill all the ants; after that, they turn down

the graſs-turf, which they had ſkinned off: the heart of the hill, and the paſture, are left as level as ever, without deſtroying any graſs: the lumps of earth that come out muſt be carted away. This work is done very expeditiouſly; where, by the great, it coſts only from four pence to ſix pence *per* hundred; at which trifling expence, you get rid of a great evil, and gain in return ten times as much. Many fields are every day to be ſeen, ſo over-run with theſe hills, that they cannot be mown, how well ſoever it would anſwer; and yet the ſlovenly occupiers have not either ſenſe, money, or ſpirit enough, to cut them up, though ſo eaſily done. But let the farmer, who would carry on his buſineſs in ſuch a manner, as to render every part of it profitable, and who ſhould always have money enough to execute what they know to be right, conduct himſelf on other rules, and not take the adage for his guide, *A penny ſaved is a penny got*; which ſtupid maxim would ſend him preſently to jail. The pence ſaved in the omiſſion of draining, of manuring, of water-furrowing, of folding ſheep, &c. &c. are all *pence gotten*; and we often ſee them ſo ſaved: but thoſe, who think they are therefore œconomiſts, are wretchedly miſtaken. The works of a ſpirited and correct agriculture ſhould never ſtand ſtill for want of money, which they never would do, if farmers were beaten out of the unprofitable practice of hiring more land than they can effectually manage. Wanting money in huſbandry is juſt as ruinous as in commerce: a merchant would make a fine figure, that had an advantageous opening for exporting a profitable cargo, but loſt it, becauſe he could afford neither a ſhip of his own, nor to freight one of his neighbours: or whoſe ſhips lay in port, becauſe he could not afford to pay the ſailors wages; or whoſe books were kept irregularly to ſave the expence of a clerk: and yet, as extravagant as all this may ſeem, it is not a

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whit more prepoſterous than letting the teams on a farm ſtand idle in a ſtable, becauſe the farmer cannot afford to buy dung for them to bring;—than plowing, ſowing, and harrowing wet land, becauſe he cannot afford to drain it;—than feeding paſtures that ought to be mown, to ſave the expence of cutting ant-hills;—than ſuffering a conſtant loſs in damaged crops, becauſe of the expence of putting the fences into repair. All theſe articles are inſtances every day to be met with among farmers, that might, and would act otherwiſe, had they *leſs* land; for then they would of courſe have *more* money. It is highly neceſſary to attend well to this matter in the hiring of farms; for if more land is taken than the ſum of money in a man's poſſeſſion will allow, he cannot poſſibly conduct himſelf by thoſe rules, which he thinks or knows to be right; he cannot even cut his ant-hills for want of money, without ſome other work of the ſame claſs being neglected.

Peaſe.

Upon dry ſoils, that plow well in winter, this is a good time to ſow the hardy hog-pea, which will remain uninjured by froſts, and be much earlier in the following year, than thoſe ſown in the ſpring. Sow about four or five buſhels an acre on the ground, and plow them in, leaving the land without any harrowing; but water-furrow it, unleſs it be quite a dry ſand. Upon ſuch ſoils, this will be a profitable employment for your teams in this idle month.

Sheep.

The lean ſtock ſheep will yet be kept on the remains of the ſummer-graſs, and on the ſheep-walks; but the fat ſtock muſt now be at turnips or cabbages. Remember that fatting cattle, of whatever ſort, ſhould have as much

meat

meat as they like ; but ſhould, at the ſame time, be prevented from making any waſte. Giving fat ſheep the turnips or cabbages is a dubious point ; many farmers urging ſtrenouſly the neceſſity of ſaving carriage. by letting the ſheep feed them off where they grow, provided the land is dry enough ; but others, ſeeing the waſte they make, are of a contrary opinion, and carry the turnips to a graſs field, where they give them the ſheep as they require, and without near ſo much waſte as is made in the other caſe. Upon theſe ſyſtems I ſhall remark, that, if the land is ſand, or as dry as ſand, you may manage to feed off without waſte ; becauſe the ſoil is ſo clean, that there is no ſoiling by dirt or poaching ; and, by bringing a ſtock of lean ſheep to eat up the leavings of the fat ones, there will not be the leaſt waſte made : but this point of lean ſtock following the fat ones is too much neglected by many farmers, who only run over their fat ſheep, and conſequently ſpoil a large proportion of their crops. The management of ſheep fatting on turnips is reckoned, by ſeveral farmers, a nice part of huſbandry : it is always a matter of conſequence to fat cattle, of whatever ſort, as faſt as poſſible; and an expence, ſomething beyond the common amount, is well beſtowed, if it accelerates the fatting of the beaſt ; thus it is good management, in many farmers, to have a ſheep-rack filled with hay always in the turnip field, that is fed by fatting ſheep: others give them bran or barley-meal, or pollard, or grains, or malt-duſt, in troughs ; the dryneſs of all which, except the grains, are an excellent oppoſite to the moiſture of the turnips, and will contribute well to the more ſpeedy fattening of them I do not, however, mention theſe aſſiſtants as being abſolutely neceſſary ; becauſe I know that thouſands of ſheep are fatted on turnips without any ſuch help. Another article of dry food, which agrees excellently

excellently with turnips, is chaff; and if that of the crops be not ſufficient, cut it with a box of ſtraw and hay: this makes very good dry meat for ſheep that are fattened on turnips or cabbages.

In the winter fatting of ſheep, it is worth obſervation, that the proper time to ſell is *April* and *May*; becauſe then mutton ſells at leaſt an halfpenny a pound dearer than at any other ſeaſon. The farmer therefore, who would winter fat to the greateſt advantage, muſt have ſome food in plenty to come in, when his turnips are gone; for he cannot keep them longer than the end of *March*, to profit: ſpring corn, ſown after turnips that are kept far into *April*, ſuffers much from late ſowing; and as the turnips, even from the beginning of *March*, ſprout out very faſt, the roots grow hard and flocky, ſo that fat ſheep will eat them but with difficulty. Hence reſults one of the ſtrong motives for cultivating cabbages, which are in full perfection when turnips are rotten and gone. The great *Scotch* cabbage, and the turnip-cabbage, alſo the cabbage-turnip, are the ſorts principally recommended for this purpoſe; becauſe they ſtand the ſevereſt froſts without damage, and the quantity they produce *per* acre, eſpecially the *Scotch* cabbage, and the cabbage-turnip, is ſo great, that no crops of turnips equal them. By means of theſe plants, you keep your fatting-ſheep to plenty of food, of the beſt kind, quite through the ſpring to the middle of *May*, and ſell them at a time, when few other farmers have any thing for their ſtock, but the young graſs of their meadows and paſtures, which they feed to the irreparable damage of their hay crops. This is perhaps the moſt peculiar uſe, to which cabbages are applicable: no other root or vegetable rivals them in this particular, if quantity of produce be conſidered, as well as the ſeaſon of feeding it. Upon light rich lands, well managed

naged, clover and ray-graſs will yield a good bite by the middle of *April*; but then the farmer muſt be particularly attentive to have ſeveral fields to ſucceed each other, as the quantity of food on an acre of ray-graſs, ſo early as the middle of *April*, is no great matter: manage how you will, you will not get any five acres of graſs to equal one of cabbages at this pinching ſeaſon. If the farmer was particularly deſirous of excelling in this branch of huſbandry, I ſhould recommend to plant *Scotch* cabbages (from the accounts we have of them) to ſucceed turnips, by the middle or latter end of *March*, to take the fat ſheep for three weeks, and have a crop of turnip-cabbages to laſt them from thence till the middle of *May*. By this conduct, he will never want food for his fat ſheep quite through the ſpring, without damaging his meadows and paſtures, according to the preſent bad cuſtom of ſo many farmers.

And, in the culture of theſe plants, let the man, who would act in the beſt manner for profit, attend well to giving them fair play. Let him not, except on very rich land, omit manuring amply, that he may command large crops, which is of peculiar importance in this caſe, not only in the value of the crop itſelf, but alſo in that which ſucceeds; for, if the cabbages are kept eating till the middle of *May*, much of the ſpring corn, that follows them, cannot be ſown till *May*, which is ſo untoward a circumſtance, that as great crops of the ſheep-food ſhould be gained as poſſible, to contract the ſpace of land ſo occupied; every pound weight gained *per* cabbage is a ſure gain in the barley that follows, as well from earlier ſowing, as from the increaſe of dung from the ſheep. Thoſe, who have experienced the evils of late ſowing, will think this a matter of importance.

ARTICLE

ARTICLE LXXII.

Of the Scheme in which Wheat is ſucceeded by Peaſe, Barley, and Oats.

[From DICKSON'S AGRICULTURE, Vol. II.]

EVERY perſon that conſiders the order of this ſucceſſion, will immediately obſerve, that fallowing or ſowing graſs-ſeeds, muſt be a neceſſary part of this ſcheme. The wheat is the firſt in order, and the oats are the laſt. Should the ſame crops be repeated in their order without a fallow, then wheat immediately follows oats, which is very improper. We muſt therefore ſuppoſe, that there is a regular fallow in every rotation, or that the order of the crops is changed after the firſt rotation. The order introduced, depends upon the number intended, and the ſituation of the land; and the directions on page 551. are ſufficient for this.

It is not eaſy to determine, whether the ſcheme here mentioned, or the ſcheme mentioned page 551. is the moſt proper one. It will not be amiſs that we compare them together, that ſo we may be the better able to judge. The two ſchemes to be compared together are theſe: The one, barley after the fallow, ſucceeded by oats, peaſe, and wheat; and the other, wheat after the fallow, ſucceeded by peaſe, barley, and oats. In both theſe, the crops are properly arranged. The wheat is ſeparated from the barley and oats by peaſe on the one ſide, and fallow on the other. The only difference is, that in the one, the fallow is immediately before the barley and oats; and in the other, it is immediately before the wheat.

If we compare theſe ſchemes with reſpect to the expence of management, we muſt determine in favours of the firſt:

firſt: For, as was hinted on page 554. in this ſix or ſeven plowings only are neceſſary in the rotation; that is, three or four for the wheat, three for the barley, and one for each of the other crops; whereas, in the other ſcheme, eight or nine are required in the rotation, that is, three or four for the wheat, three for the barley, and one for each of the other two crops. This is certainly well worthy of attention, and, when all other circumſtances are equal, ſhould determine the queſtion.

If we compare theſe ſchemes, with reſpect to the ſituation of the land after the rotation is finiſhed, we find very little difference, or rather that this depends upon the kind of ſoil. It is certain that land, ſuppoſing it to carry equal crops of corn, is exhauſted of its vegetable food, in proportion to the number and kinds of weeds that it nouriſhes along with theſe crops. It is certain likewiſe, that when wheat is ſown immediately after the fallow, root weeds are moſt encouraged; and that, when barley is ſown after the fallow, ſeed-weeds are moſt encouraged Any of the ſeed-weeds that ſpring along with the wheat, are deſtroyed by the winter-froſt, and, in the ſpring, the ſurface is, generally ſpeaking, ſo firm, and if the land is in good order, it is ſo well covered, that few of the ſeeds vegetate; or, if they ſhould, are not allowed to come to perfection. Beſides the ſpring-plowings given to the barley, which is in this ſcheme the third crop after the fallow, is a means of preventing the increaſe of theſe weeds. But if there are any root-weeds left in the fallow, theſe continuing long undiſturbed during the wheat crop, in a well prepared ſoil, are thereby allowed to extend themſelves; and the ſpring-plowings given to the barley-land, though they have ſome influence in a good ſeaſon, yet are not ſo proper to deſtroy theſe as ſeed-weeds.

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The ſowing barley immediately after the fallow, has a contrary effect. The root-weeds ſuppoſed to be in the field at the ſowing of the wheat, and encouraged by the ſituation in which the wheat land lies through the winter, are checked by the manner in which the fallow is laid up during the winter for the barley; for it muſt be remembered, that the fallow for barley, from its ſituation, is much drier during the winter, than when it is ſown with wheat in the autumn; the growth of theſe weeds are likewiſe in ſome degree checked by the ſpring plowing given to the barley, if the ſeaſon is good. On the other hand, the ſituation in which the fallow for barley is put in the autumn, is not ſo favourable for the ſpringing of ſeed-weeds, as the ſituation of the wheat-land when harrowed; ſo that a ſmaller quantity are deſtroyed by the winter froſt: But the ſpring-plowing and harrowing encourage them to grow along with the crop; and though the crop ſhould be very rich, yet ſome of them will come to perfection; and the land receiving only one plowing for each of the other crops that follow, little or no check is given to their increaſe. From theſe things then, it ſeems to follow, that the ſowing barley immediately after the fallow, has the advantage in land inclined to root-weeds, and that the ſowing wheat immediately after the fallow, has the advantage in land inclined to ſeed-weeds. It is uncertain, whether or no the two additional plowings, given in the one ſcheme more than in the other, have any influence upon the ſituation of the land, when the rotation is conpleated. It is probable, that at the firſt plowing of the fallow, ſome difference may be found, that the fallow after the oats is eaſier plowed, than the fallow after the wheat; but this difference is probably made up by the ſituation in which the fallow for barley is laid during the winter, before it is ſown.

In comparing theſe two ſchemes, we have ſuppoſed, that the crops produced in a rotation of each, are of equal value; but it is probable, that there may be ſomething in the difference of ſoils, to make the one ſcheme better adapted to one kind of ſoil, and the other ſcheme better adapted to another kind; and conſequently that better crops may be expected, when the ſchemes are thus adapted to the ſoils, than when otherwiſe. An inquiry into this will not be thought improper.

It has already been obſerved, with reſpect to theſe ſchemes, that the one encourages one kind of weeds, and the other another kind: It is certain, that as weeds exhauſt land of its vegetable food, ſo in proportion to this they leſſen the crops. It is probable then, that that ſcheme ſucceeds beſt, which is beſt adapted to diſcourage the weeds to which the land, on which it is fallowed, is moſt liable.

It has been obſerved likewiſe, that in agriculture much depends upon performing the different operations required, when the land is in a proper ſituation for receiving them. Every farmer expects a good crop, when he has had a good ſeaſon for plowing and ſowing On the other hand, he fears a bad one, when he is obliged to plow or ſow when the land is in a bad ſituation. One of the ſchemes mentioned requires more plowings at certain ſeaſons than the other When wheat is ſown upon the fallow, the barley-land muſt be plowed in winter. When barley is ſown upon the fallow, there is no neceſſity for this. All kinds of land receive much leſs benefit from plowing when they are wet, than when dry; and all wet lands, particularly the clays, are in that ſituation during the winter ſeaſon; and therefore the ſcheme of management that requires the leſs frequent plowings in that ſeaſon, will probably be moſt ſucceſsful. In this I have the barley-land particularly in view, as the barley is a more tender plant, than either the

oat

oat or pea, and needs more culture. When barley is ſown upon the fallow, both the barley and wheat lands are plowed in a ſeaſon, when there is the greateſt reaſon to expect, that they will be in proper order The fallow is plowed in ſummer, in the time of harveſt, or immediately after: It may be laid up before winter, in ſuch a way as beſt to defend it againſt the rain; and as ſoon as it is in a proper condition in the ſpring, may receive the ſeed-furrow, or the ſeed may be ſown upon the winter furrow. Beſides, as dung is laid upon the fallow, if this is done either in autumn, or in the time of the winter froſt, the ſoil is thereby mellowed, and in a proper condition for receiving the ſeed-furrow, if neceſſary, when the ſpring drought ſets in. As in this ſcheme, the wheat is ſown after peaſe, the wheat-land, unleſs the harveſt is very late, or the winter rains ſet in very early, is always in a proper condition when plowed. But when wheat is ſown upon the fallow, if the land is naturally wet, the barley-land muſt either be deprived of the ſpring plowing, or is in danger of receiving it in bad order, by either of which the crop muſt be leſſened.

When the land is dry, there are no ſuch diſadvantages in ſowing wheat upon the fallow, as the ſeaſon is ſeldom or never ſo bad, as to prevent the barley-land from receiving all its plowings in proper order. In this kind of land then, eſpecially if there is any thing in the nature of it that diſpoſes it to wheat rather than barley, the wheat may be ſown upon the fallow; but when land is wet, and particularly when it is ſtiff in its nature, it ſeems more proper to follow the other ſcheme, and ſow barley.

Sometimes it is obſerved, that the crop of wheat, upon the fallow, fails, when it is very good after peaſe. This happens when the ſoil is well reduced by the fallow, and there are ſudden changes from froſt to thaw. Theſe changes

ges occaſion a fermentation in the ſoil, which expoſes the roots of the plants to be deſtroyed by the froſt-wind, and are ſometimes ſo violent as to throw the plants entirely out of the ground. This is another reaſon for ſowing barley on the fallow, in ſuch ſoils as are liable to ſuch a violent fermentation.

In comparing theſe two ſchemes together, it may be further obſerved in favours of ſowing barley upon the fallow, that when the barley-fallow receives no more furrows than the wheat-fallow, the farmer has it in his power to plow a great part of his oat-land before the wet ſeaſon comes on, which in wet clay land is a very great advantage.

I ſhall only add, that, as in ſowing wheat upon the fallow, there is one fourth part more plowing than when barley is ſown, the farmer, that proſecutes the laſt ſcheme, may ſave a conſiderable expence in management; or if not, he may employ it in ſome way that may render it more beneficial.

Of Wheat upon Fallow followed by Oats, Peaſe and Barley.

It is commonly reckoned very bad huſbandry to ſow oats after wheat. In the tacks or leaſes, in which the farmers are reſtricted in the manner of cropping, this is one of the things that is provided againſt: And indeed I am perſuaded, that it would be found very improper in the ordinary ſchemes, and tend much to impoveriſh the land. Both wheat and oats are ſevere crops, when they follow each other; therefore immediately, without ſome more favourable crop, or a fallow interveening, it is natural to ſuppoſe, that the land on which they are raiſed will be left in very bad order. However, this practice is found to ſucceed on ſome kinds of land in ſome particular ſituations. Not only the crop of oats is good, but the peaſe

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that follow, and, I need not add, the crop likewiſe that follows the peaſe, as a good crop of peaſe is almoſt a ſecurity for the goodneſs of the crop that follows, if the land is properly managed.

The kind of land here mentioned is a wet clay, and the particular ſituation is, when the land is properly cleaned, and well reduced by a fallow.

This kind of land, carefully fallowed and well dunged, ſeldom fails in producing a good crop of wheat. In the ordinary ſchemes of management, after fallow-wheat, is ſown either peaſe or barley. When barley is ſown after wheat, it is ſcarcely poſſible in this kind of land to plow dry in the winter or ſpring ſeaſons; and wet plowing renders the ſurface ſo tough or hard as to endanger the crop; and indeed it is obſerved, that barley is a precarious crop on wet clays, except when they are fallowed, and the barley ſown upon the winter-furrow.

When barley is ſown upon fallow, oats commonly ſucceed. The land being left open by the barley-crop, eaſily receives the water, and therefore, early in the winter is often in a ſituation improper for being plowed to advantage. After harveſt, the land for barley muſt be fallowed, and the wheat ſeed made before the land for oats is plowed: and hence the wet clays are often too wet after a barley crop before they are plowed for oats, by which the crop is endangered.

When wheat is ſown upon the fallow, the land after the crop is much firmer than when barley is ſown, and by this means, it can much longer reſiſt the rains; ſo that land plowed for oats after a crop of wheat, is in better order at the ſame ſeaſon, than land plowed for oats after a crop of barley. And upon the ſituation of the land when it is plowed, depends in a great meaſure the goodneſs of the crop.

Upon

Upon rich wet clays, peaſe is a more certain crop than barley. But when this kind of ſoil is well reduced by a fallow, the peaſe crop, when introduced ſoon after it, becomes precarious. Although clay is capable of being pulverized very minutely, yet the particles to which a clay ſoil are reduced by fallowing, are larger than the particles of a loamy ſoil; and hence, by this operation, it is rendered opener, and its pores are made larger and more numerous. When dung is added to plowing, as is commonly done when this kind of land is fallowed, it is rendered ſtill more open; and for this reaſon the peaſe-crop is the leſs precarious, the firmer that the land is made after the fallow, provided it is not too much exhauſted. From theſe things it ſeems probable, that, on rich wet clays well reduced by a fallow, a crop of oats is not only a more certain crop after wheat than either peaſe or barley, but is in ſome meaſure even a preparation for the peaſe-crop that follows.

Barley very naturally ſucceeds the crop of peaſe; but if graſs-ſeeds are not ſown with the barley, it may be proper to take another crop of oats before the land is fallowed.

Of the Scheme in which Wheat, Barley and Peaſe, are ſown without Oats.

Though the oats are very well adapted to the land of Scotland in general, yet, in ſome of our beſt lands they do not ſucceed ſo well as ſome of the other grains. When this is the caſe, they may be very properly kept out of the ſucceſſion; and the crops in the order mentioned in the title, may follow each other in as many rotations as is proper for the land. The fallow may be very properly introduced immediately after the wheat, and either wheat or barley may be ſown immediately after it. Which of the

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two is moſt proper, the nature of the ſoil, and other circumſtances, muſt determine.

When barley is ſown upon the fallow, then the fallow may be regularly introduced every fourth year, and the ſame rotation conſtantly obſerved. But when wheat is ſown on the fallow, then either more crops than three muſt be taken, or the order of the ſucceſſion altered. When barley and peaſe follow the wheat, either another crop of wheat or another crop of barley muſt be added, as it is improper to fallow after a crop of peaſe, unleſs it is bad, and, in that caſe, as has already been directed, the peaſe ought to be plowed in. If it is improper to take more than three crops after the fallow, the order of ſucceſſion ought to be changed; and inſtead of barley after the wheat, peaſe ought to be ſown, after the peaſe barley, and ſo fallow again. In this ſcheme of throwing out the oats, it may perhaps be found proper to take four crops regularly, and to ſow wheat and barley alternately on the fallow. On this plan, there are always two crops of the grain ſown on the fallow, and one of each of the other two.

When the farmer propoſes to keep his land for ſome time in tillage without fallowing, this ſcheme of throwing out the oats may be a very proper one for him to follow. And in this caſe, it may not be improper to enquire, in what manner the dung is to be applied? It has already been obſerved, that when wheat is followed by barley, oats, and peaſe, without fallow, there is no fixed crop for this; that, according to the ſituation of the land, it may be applied either to the wheat, the barley, or the peaſe. To what was mentioned on that head, I ſhall only add, that as weeds are more diſcouraged in this than in the other ſcheme, by the barley and peaſe crops returning more frequently, the dung may with greater ſucceſs be applied to the wheat. As there are more plowings in this ſcheme

than

than in the other, being as ten to nine, and as the oats, when a fourth crop, are ſeverer than a fourth part of the other three, it may be expected, that, when the land is rich, it will be kept in better order by the ſcheme without oats, than by the ſcheme with them. But this need not be inſiſted upon, as it is improper in any caſe to continue land long in tillage, without fallowing.

Before this article is finiſhed, it is neceſſary to obſerve, that this ſcheme of throwing out the oats, whether with or without a fallow, is not very favourable to the œconomy of the farm. When there is no fallow, there is little work in the ſummer; even when there is fallow, there is little in the winter; and often there will be a great hurry both in the autumn and ſpring.

Of the Scheme in which Barley, Oats, and Peaſe, are ſown without Wheat.

A great part of our land in Scotland is improper for wheat, and yet many, from a natural partiality to what belongs to themſelves, are inclined to ſow wheat, though the ſowing of ſome other grain leſs valuable, and at the ſame time leſs ſevere upon the land, would be more for their advantage. Land of this kind is ſometimes fallowed with great care and at great expence, and wheat is ſown. Perhaps the wheat-crop turns out tolerably well, which indulges the vanity of the poſſeſſor, and prevents him from obſerving, that, by his crop of wheat, his land is reduced almoſt to the ſame ſituation in which it was before the fallow. Whereas, had he ſown barley or oats upon his fallow, though his crop perhaps would not have been quite ſo valuable, yet his land would have been left by the crop in much better order. I would therefore caution perſons poſſeſſed of ordinary kind of land, againſt a fondneſs for ſowing wheat, and adviſe them to content themſelves with the

other grains for which their land is better adapted, and from which they will reap a greater profit.

The fallow in this ſcheme is properly introduced, either immediately before the barley or the oats. If dung is to be laid upon the fallow, the ſowing barley is the moſt proper; but if no dung is to be laid on, then oats are the moſt proper. When barley is ſown upon the fallow, and the crops ſucceed as in the title of this head, then there muſt be more than one rotation. In this order of ſucceſſion, when the barley is the firſt after the fallow, the peaſe are the laſt: And it is improper to ſtop there, as the land muſt be ſuppoſed ſtill in very good order. If one other crop only is propoſed to be taken, it may be either barley or oats: If two, firſt barley and then oats; and after the oats, the fallow is again naturally introduced. By this ſcheme the land is fallowed and dunged every ſeventh year. But although there are ſome farmers, that neither dung nor fallow oftener, yet this cannot be reckoned a good ſcheme of management. However, if they will not be prevailed upon to fallow oftener, they ought certainly to lay on a little dung, and this may very properly be done to the ſecond crop of barley.

When the farmer is diſpoſed to ſow the grains mentioned without wheat, and at the ſame time fallow every fourth year, which is a ſcheme that muſt certainly turn out to advantage, then he muſt either ſow oats upon the fallow, or alter the order of ſucceſſion.

When oats are ſown upon the fallow, peaſe and barley very naturally follow, and if a ſmall quantity of dung could be regularly procured to the barley, this ſcheme would certainly be a means of keeping the land always in good order, and therefore a conſtant ſucceſſion of good crops might be expected. Or in this caſe the order of ſucceſſion may be altered; barley may be ſown upon the fallow, and after the barley, peaſe, and oats This form of ſucceſſion

cannot be ſuppoſed to keep the land in ſo good order as the other, but then there is much leſs plowing, being in the proportion of five to ſeven.

By this ſcheme, particularly when barley is ſown upon the fallow, and peaſe is the ſecond crop, the land muſt be very looſe and open at the time of ſowing this crop, having the benefit of fallow and dung to the preceeding crop, and the former plowings perhaps not above nine months before. In this caſe, the proper way is to ſow the peaſe upon the ſtubble, and plow them in, except the land is naturally very ſtiff. By this, as was obſerved, when treating of the culture of peaſe, the ſeed will be laid upon a firmer ſoil, and in leſs danger of being hurt by rain, either immediately after ſowing, or in ſummer.

Of the Schemes in which the ſowing or planting of Rootsor Greens is introduced.

In farms where there are cattle or ſheep, the providing food for fattening theſe in the winter ſeaſon, or even for maintaining them, is important. This is done by the ſowing or planting of roots or greens. The chief of theſe are the turnip or potatoe: At leaſt, theſe can only be introduced with advantage into a general ſcheme of management. The different kinds of cole may indeed be uſed; but the turnip is preferable: It ſerves the ſame purpoſes of food to ſheep or cattle, and a larger crop may be expected. But what is of greater conſequence, is, that the turnip is not ſo early ſown, and therefore allows the land to be much better prepared.

The manner, in which a crop of turnip ought to be introduced, depends upon the value of the crop of turnip, compared with the value of the other crops. The crop of turnip is ſo valuable in ſome parts of England, that the farmer is tempted ſometimes to over-turnip his fields, and to ſow a ſecond, and ſometimes a third crop, without any other kind of crop interveening. If a crop of turnip was

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as valuable in Scotland, it would deſerve a very particular attention. This, however, is not the caſe; turnips are not ſo valuable in Scotland as in England,; and this is not altogether owing to our being unacquainted with their uſes and qualities (though this too is partly the cauſe) but from this, that there is a leſs demand for butcher meat in the winter-ſeaſon. This demand, however, in Scotland, is daily increaſing, and, in conſequence of it, we may expect, that the value of a crop of turnip will daily increaſe likewiſe. In ſome places, it is already of ſuch a value, as to entitle it to the attention of the farmer, at leaſt to the attention of every one that is not far from the butcher-market.

The great objection of the farmer to the ſowing of turnips, is the great culture which they require. This makes it difficult for the ordinary ſervants upon a farm, to manage any quantity worthy of attention. In the neighbourhood of villages this defect can eaſily be ſupplied. Perhaps, if the farmer was once acquainted with the moſt proper œconomy in the culture of this crop, he would find the labour much leſs than what it appears to be.

In Scotland, the ordinary way of introducing a crop of turnips, is by ſowing them upon the fallow. In this caſe, the fallow receives the firſt plowing early in the ſpring: After the barley ſeed is over, the land, by frequent plowings and harrowings, is reduced as much to a powder as poſſible before the firſt of July, the time of ſowing the turnips. By this means the land, though it carries a crop, receives a tolerable fallowing: and the weeds that ſpring after the turnip is ſown, are deſtroyed by the hoe.

When turnip is ſown upon fallow, barley muſt ſucceed, for the turnips remain in the ground till the ſeaſon for ſowing the other grains is paſt; but this is no diſadvantage, as the ſowing of barley upon the fallow is, in many caſes, as advantageous as the ſowing of wheat; and beſides

ſides it is obſerved, that a good crop of barley, unleſs ſome unfavourable circumſtances interveene, is certain, after a crop of turnip fed by ſheep upon the field.

In this ſcheme there is a crop every year; But as a crop of turnip is far from being ſo ſevere on the land as a crop of any kind of corn; and as the culture given to this crop is nearly equal to a fallow, the land muſt be kept in better order by this ſcheme, than by thoſe in which there are the ſame crops of corn without fallow.

To bring the turnip crop ſtill nearer to a fallow, ſome perſons ſow them in rows about three feet and a half or four feet diſtant from each other, and horſe-hoe betwixt the rows. By this the land is oftener plowed, and it lies in a proper ſituation through the winter, as the number and depth of the furrows give an eaſy paſſage to the water: Beſides, there is leſs hand-labour, and the crop can be taken off more eaſily, and with leſs hurt to the land. No part of the field is hand hoed except the rows, and after the firſt hoeing few weeds appear: And inſtead of poaching the land in a very wet ſeaſon, by the cattle going upon it in carrying off the turnip which muſt be done, or they muſt be carried by men at much greater expence, a horſe with creels can go in the furrow betwixt the rows, and receive the turnip from each ſide, without doing the ſmalleſt hurt.

But though the turnip crop ſhould be horſe-hoed, yet it cannot prepare the land ſo well as a compleat fallow; and therefore the introducing a turnip-crop in place of the fallow, however advantageous it may be at firſt, muſt in the end prove hurtful. When this practice then is followed, it ſeems requiſite to take fewer crops of corn, and thereby make the turnip crop to return oftener; or, if the demand for turnips does not allow this, to introduce a hay-crop in their place. Thus, if it is propoſed to take three crops of corn, after the turnip, may follow very properly barley,

peaſe

peaſe and wheat; and if only two, barley and oats. In theſe caſes, when there are only two or three crops of corn taken, if there is not a ſufficient demand for turnips, to allow a crop of them once in the three or four years, a crop of hay may be introduced in its place, and a ſucceſſion of the ſame and other crops may follow.

The potatoe is the other root, a crop of which is introduced into a ſcheme of management. The culture of the potatoe is very different from that of the turnip; it is planted much earlier in the ſeaſon, and taken up much ſooner. It is planted in March or April, and taken up in September or October. It requires as much, if not more, culture than the turnip; it takes much more labour to plant and take it up. This muſt prevent the potatoes from being very frequent, except in the neighbourhood of a town, or villages. However, even in places where extraordinary hands cannot be got, it is very proper to plant a few; for as there is a certain maket for them, and as they are very proper for feeding cattle, they generally turn out a very advantageous crop to the farmer.

But though the crop itſelf turns out more advantageous to the farmer than a crop of turnips, yet it cannot be introduced into a general ſcheme of management, with ſo much advantage to the ſcheme. It is not ſo proper to be introduced in the place of a fallow. The early planting prevents all the benefit that ariſes from the plowings given to the turnip land before the ſeed is ſown; and the manner of taking up the potatoes obliges the land to be left in a ſituation very unfit for the winter, unleſs the expence of another plowing is added; and after the potatoes are taken up, it is rather too late to ſow wheat, unleſs the ſeaſon is favourable. The diſadvantages of a crop of potatoes in a general ſcheme, are not ſo great when they are planted in rows, at ſuch diſtance as to allow horſe-hoeing. By this means

means the land gets a kind of fallowing; but it is evident, that the plowings in horſe-hoeing being much confined, cannot anſwer all the purpoſes of plowing, ſo much as thoſe given the fallow, which can be done in the moſt proper manner. If therefore a crop of potatoes is to be introduced into a ſcheme of management, it is very improper to make it ſerve in place of a fallow. Unleſs a crop of potatoes is horſe-hoed; it may be reckoned ſeverer than a crop of peaſe, and nearly as ſevere as a crop of barley. There is a great deceit in the firſt trials of potatoes with regard to this. If the land on which they are planted is much infeſted with weeds, the deſtruction of theſe weeds occaſioned by the frequent hoeings given to the potatoes, prepares the land for a crop of barley; and hence a crop of potatoes is falſely reckoned beneficial to land. But let the land be properly cleaned, and then the hoeings given the potatoes not being ſo beneficial, it will ſoon be diſcovered, that a crop of them is as hurtful as a crop of hoed-barley, and much more hurtful than a crop of hoed-peaſe. It is proper to compare them with hoed-crops themſelves as they are hoed, and as the land that carries them receives ſome benefit from this operation.

But though a crop of potatoes cannot properly be introduced in the place of a fallow, yet it may be introduced into thoſe ſchemes in which fallowing is not thought neceſſary, or in the other ſchemes along with a fallow. Thus when wheat is ſucceeded by barley, oats and peaſe, or by barley and peaſe, without a fallow, the crop of potatoes is very properly introduced betwixt the wheat and barley. When barley is ſucceeded by oats and peaſe, it may be introduced betwixt the barley and oats. Betwixt the ſame two crops it may be introduced when barley is ſown upon the fallow, and fallowed by oats, peaſe and wheat.

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The introducing potatoes into thoſe ſchemes where there is no fallow is particularly advantageous. This kind of land, from the conſtant cropping, and frequent dunging, cannot be clean. The laying dung upon land that is foul, endangers the crop that immediately follows, and if the crop is not hurt, occaſions a very great increaſe of weeds. This is prevented by laying on the dung to the potatoe-crop; for this crop always receives benefit from dung; and the encouragement that dung gives to the growth of weeds in this caſe, tends to their deſtruction. Even when the land is fallowed for barley, if a crop of potatoes is to be introduced betwixt the barley and oats, it will probably be found to be the beſt method not to lay the dung upon the fallow, but before planting the potatoes. If the land is naturally good, the fallowing will produce a good crop of barley; and the hoeing the potatoes, after the dung is laid on, will greatly diſcourage the growth of weeds, and ſecure better crops of the other kinds of grain that follow in the rotation. What has been ſaid with reſpect to the laying on the dung to the potatoes, may be applied likeways to the turnip. When a crop of turnip is introduced in the place of the fallow, it is always ſuppoſed that they are to be dunged; but even when both a crop of turnip, and a compleat fallow, are introduced into the ſame ſcheme, it may be found often the moſt proper method to ſow oats upon the fallow without dung, and to apply the dung to the turnip-crop that follows. This is a more proper way to diſcourage the growth of weeds, than laying the dung upon the fallow.

ARTICLE

ARTICLE. LXXIII.

ABRIDGEMENT OF HUSBANDRY ANATOMISED: By JAMES DONALDSON.

[Continued from our laſt, p. 578.]

CHAP. VI.

Concerning Planting of Trees.

I Recommended planting trees for ſhelter, as a great mean to enrich the ground; and the planting of fruit trees, as very beneficial in reſpect of their fruit. Much has been written on theſe ſubjects, better than I can pretend to do. What I intend, is, only to give the husbandman, who has not opportunity of ſeeing theſe books, a ſhort hint of what he may do in this matter, without much expence or trouble, as a day's labour or two, of one man in the year, will bring up a greater nurſery than he will need.

Dreſs a little bit of the garden, and thereon ſow the ſeeds of ſuch trees as you wiſh to have; ſuffer not any weeds to grow amongſt them. If the plants ſhall riſe cloſer than they can well grow together in the nurſery, tranſplant them to another place; ſo that while they remain in the ſeed-bed or nurſery, they may be about a foot or eight inches diſtant. If you raiſe but two or three hundred every year, you will ſoon plant all your hedges; and when they are about ſix or eight years old, they may be tranſplanted about the borders of your fields.

Fruit trees may as eaſily be brought up from the ſeed as the barren trees: But when they are about an inch thick in the ſtem, they muſt be ingrafted; which is done thus, with a ſharp knife, Cut the ſtock of the tree about a foot and a half from the ground; after making it very ſmooth,

ſmooth, ſlit it down a little to receive the graff. The graffs ſhould be handſome twigs of one year's growth, taken from the beſt fruit trees you can get, cutting off the top, leaving it about ſix inches long, and containing two or three eyes or joints, let an inch and an half, or thereby, remain under the loweſt joint of the twig; which you make in form of a wedge, letting the bark or rind remain upon the edge of it: then put it into the ſlit in the ſtock, joining the rind of the graff exactly with the rind or bark of the ſtock: Wrap a piece of clay round the place, where they are joined to defend it from the rain, till the wound cloſe, and they are united, tying it with ſome baſs to keep it on.

Fruit trees ſhould be planted out at about thirty foot diſtance at leaſt; and if the ground is cold, dig a hole two or three foot deep, and ſix or eight foot broad, fill it with good earth, mixed up with old rotten dung, and therein plant your tree; for when the roots of a tree are placed upon cold till or clay, it cannot thrive. And if the ſame rule was obſerved in planting the barren trees, or the ground was to be dunged, where hedges are to be planted, they would come much quicker forward.

CHAP. VII.

Of ſowing and planting Garden Seeds and Roots.

I have recommended the uſe of garden roots and herbs as more profitable to farmers, than always to make uſe of grain for the maintenance of their families: I have endeavoured to ſhew, that any kind of ground may be made fertile by induſtry. Now, by fencing the garden from ſtorms, by hedging and planting, and by dunging it well, they may have roots and herbs in abundance. The ground ſhould be fully trenched about Hallowday; and after lying rough all winter, it ſhould be dunged and delved once

or twice in the ſpring, till it is brought to a proper condition for ſowing different kinds of garden ſeeds, and planting potatoes, kale, and cabbages. By this means, from the middle of Auguſt he may have potatoes; from March he will be ſupplied with leeks and parſnips; from May to October, kale, cabbages, carrots and turnips; and onions all the year round *.

CHAP. VIII.

Several Objections anſwered.

Objection I. It may be aſked, If ſuch benefit is to be reaped from the methods I have adviſed, why are they ſo univerſally contemned and neglected in the country?

This may be aſcribed to three ſeveral cauſes; two of which may be remedied by the landlords; the third belongs to the tenants themſelves to remedy. 1. When a tenant makes any remarkable improvement on his farm, the avarice of the landlord is awakened, and he obliges the tenant either to pay a higher rent, or to remove; in ſo much, that it is become a proverb, and none more true, *Bouch and Sit*, *Improve and Flit*. And I doubt not, that if tenants had certain ſecurity for continuing in poſſeſſion, they would thereby be much encouraged to improve them. 2*dly*, Another cauſe, why farmers make ſo little improvement on their lands, is, poverty, that great enemy to virtue and

* The greateſt part of this Chapter is taken up with Directions for raiſing potatoes. As that root was but little known in our Author's time, and propagated only in gardens, his directions are very imperfect, and are only for raiſing them in the lazy bed: which it was needleſs to take down, as much better and more improved methods are now generally known, and applied to raiſing them and turnips both in the open fields.

and induſtry; for people that are empty handed, are glad to accept of any thing that firſt offers, rather than wait for greater things in futurity. In this caſe, where landlords have a well diſpoſed tenant, they might give him encouragement, by a leſs rigorous exaction of his rent, till his improvements begin to yield him ſome profit. But, 3*dly*, The chief and principal cauſe is, want of ſkill in the tenants, to forecaſt and calculate the ordering of their buſineſs; moſt of them, thinking it better to take a ſcanty crop of corn, rather than leave their land in graſs; not conſidering, that, by leaving a more conſiderable part of their land in graſs, the reſt that is manured is much more enriched by getting a greater allowance of dung; and at the ſame time, the part that is left in graſs, is thereby brought into a more fertile condition. But I have already ſo fully ſhown the profits of dividing farms properly, and taking only ſo much into manures, as can be kept in a good and ſufficient condition, that I need ſay no more on that point. And ſhall only intreat our farmers, to apply, in a literal ſenſe, the two parables of our Saviour, "Of a "King's going to make war, and a man's beginning to "build;" for whoever undertakes a buſineſs, that is above his power to accompliſh, ten to one but his project miſcarries.

Objection II. Though the methods propoſed ſhall be followed, the profits will not be ſo high as are ſtated: For, in chap. iii. you have reckoned all things at a diſadvantage in the firſt example; and to the advantage in the ſecond.

The contrary of this is true; for in the diviſion of croft and outfield, the croft in the ſecond inſtance gets more than double the allowance of dung it gets in the firſt; and the differences of product is ſtated only at three bolls *per* acre,

acre, which cannot be reckoned extraordinary. Nevertheleſs admit, that the difference ſhall be only two bolls, that is, let us ſuppoſe, that according to the firſt way of manuring, the croft ſhall produce five bolls *per* acre, the odds will be greater than I reckoned it, if you cut off the additional rent of L. 150 I allow for the ſecond farm, more than was ſuppoſed for the firſt. But beſides, there were ſix bolls of ſeed, and four of horſe corn ſaved, which were not reckoned in that account. I think I have given ſatiſfying reaſons, why in the latter caſe, the outfield may be ſuppoſed to yield a boll more *per* acre than in the firſt. And the profits ſtated on the Cattle, I think none can doubt of.

Objection III. Hedges will not grow on any barren ground; and if they ſhould, they afford little ſhelter to the ground, beyond the breadth of a ridge or two.

I have already ſhown, that any ground by induſtry may be rendered fertile, and ſo fitted for rearing hedges. But to be more particular, when you intend to plant a hedge, and have marked off the line of the ditch, take the ſurface earth of the ditch, and throw it up on the dyke, and on it plant the hedge, and cover it with the remaining earth of the ditch. If the ground is very barren and cold, mix dung with it before you plant the quicks; for as I obſerved with reſpect to trees, if the roots are planted in a cold clay or till, they ſeldom thrive: It is the ſame with thorns: Whereas being planted in the ſurface earth, which is always richer and warmer than what is below, and eſpecially if enriched by dung or lime, they will thrive exceedingly. In order to preſerve the hedge while young, if the fields next them are kept in corn, the beaſts will have no acceſs to them in ſummer; and in winter, the cattle ſeeing nothing to tempt them to break into the incloſed fields, the

the hedge and the ditch will be ſufficient to reſtrain them.

As to the ſhelter afforded by hedges, it is much greater than the common farmers will admit. If the incloſures are not too large, and the hedges are come to any maturity, the whole incloſure will receive benefit from them, and the cattle will have ſhelter from the ſtorm, whatever point it blows from. But it muſt be remembered, that I alſo recommended the planting of trees in the hedges, which in time will afford very great ſhelter.

Another great benefit ariſing from incloſing, not formerly mentioned, is, that the cattle have acceſs only to ſuch fields as the farmer pleaſes, whereby the ground is preſerved from being poached, and the ſward broke by their feet, by which the ground is chilled by the water ſtanding in their footſteps.

And here it may be obſerved, that although water ſtanding in the footſteps of cattle moiſteneth the ground too much and chilleth it, yet watering of graſs grounds is a very great improvement, and ought not to be omitted, where there is a command of water. It is performed in this manner; when you can bring water into a ditch along the head of your field, make a little gap or opening upon the head of every ridge, that you may open or cloſe at pleaſure; from theſe draw furrows with the plough or ſpade, ſquintways in the declining of the hill, from the furrow between the ridges, to the top or middle of the ridge where it is left without any conduit, and it ſpreads and waters the ground. When it falleth down into the furrow, it is to be raiſed up to the middle of the ridge as before; and ſo renew the conduits, till it come to the loweſt part of the field.

Objection

Objection IV. You recommend the houſing of ſheep; whereas it is hardly poſſible to build huts for ſo great a number of ſheep: and to take part of their paſture ground into manure, which is impracticable, for the land is ſo mountainous, that it cannot be plowed.

I anſwer, that where the land is mountainous and cannot be plowed, lay the dung of the cattle upon the graſs, which will greatly improve it. But there are few farms ſo mountainous, but part of it may be made arable.

And as to building the huts, the profit of their dung, will much more than ten times recompence the trouble: The expence of tar and butter uſed in ſmearing the ſheep for one year, will build them huts that will laſt for ten years. And beſides, not only the ſheep are thereby kept in a better condition, but their wool is greatly improven.

Objection V. The benefit of ſheeps dung by keeping them in huts is nought: for however much the ground on which it is laid may be bettered, the paſtures on which they fed muſt be ſo much the worſe: for, when the ſheep lye in the fields, the paſture is enriched by the dung, which is ſpread equally over it.

There is ſome ſeeming reaſon in this objection; but upon examination it flies off. When the dung gets leave to lye above ground, not only much of its ſtrength is diffuſed into the air, and exhaled by the ſun's heat; and being ſcattered up and down in very ſmall quantitys, the ſalt that is in it cannot overcome the natural coldneſs of the earth. If a piece of red hot iron, that would warm one pint of water, is put into a body of twenty or thirty pints, the iron would be ſoon cooled, and the water be little or nothing the warmer: In like manner, this quantity of dung, that is ſufficient to warm and enrich thirty acres of land yearly, being

being ſcattered up and down a thouſand acres, the effects of it will never be known

Objection VI. You adviſe to dung the paſtures where the ground is not arable; but the graſs in that caſe will rott the ſheep.

In anſwer to this, I adviſed to make hay of it the firſt year; for there is no ground that bears graſs, but it may be made ſo fertile, as to make the graſs grow long enough for hay: But if it ſhould not, yet it may be fed for the firſt or ſecond year, with other cattle, or with the ſheep intended to be fattened and ſold.

Objection VII. Your orchards and bee-hyves are for gentlemen to look after; we have not time for ſuch conceits; we muſt be taken up about ſome other buſineſs.

I have ſhown, that there is profit, as well as pleaſure, ariſing from theſe. The orchard is in effect a hay park; and beſides the profit from the fruit of the trees, you will have as much profit from the ground, as from any part of the farm. The bees require but little pains or expence; there is no ſituation ſo barren, but will afford them food; and the profit in honey and wax may be very conſiderable.

ARTICLE

ARTICLE. LXXIV.

An account of the Produce of the POTATOES, *named The* ROYAL FORRESTER, *and* RED NOSED KIDNEY; *mentioned in* page 187.

To the EDITOR of the SCOTS FARMER.

SIR,

I Write this to acquaint you, that I planted the dozen of ROYAL FORRESTER POTATOES, and the like quantity of RED NOSED KIDNEY POTATOES, you ſent me; each in half a fall of garden ground without dung, and have, in return, about a firlot of each kind. The RED NOSED are the largeſt in general, and filled the firlot rather a little higher than the other; but even the ROYAL FORRESTER filled it ſo well, that I am perſuaded it would not have held above one half dozen of middling Potatoes. I alſo planted two dozen of another kind of Potatoes, in about the ſame quantity of contiguous ground, and had not above three pecks in return. The ſeed of theſe laſt was not quite ſo large as that of the ROYAL FORRESTER and RED NOSED KIDNEY, and they are in general rather ſmaller than either, and yet not ill ſized. I have only to add, that the different ſpecies are hardly to be diſtinguiſhed, there being many of the RED NOSED KIDNEY, round like the FORRESTER, and of the FORRESTER, flat like the KIDNEY. The third kind of Potatoes, were ſomething like the SPANISH GRAY.

Edinburgh, I am,
November 8th, 1774. SIR,
your moſt humble Servant,

A—— D——

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